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AGRICULTURE AND AMERICAN INDIANS

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Cover photo: Navajo cattlemen buy breeding stock to upgrade cattle production on the reservation (Courtesy, Bureau of Indian Affairs, Department of the Interior).

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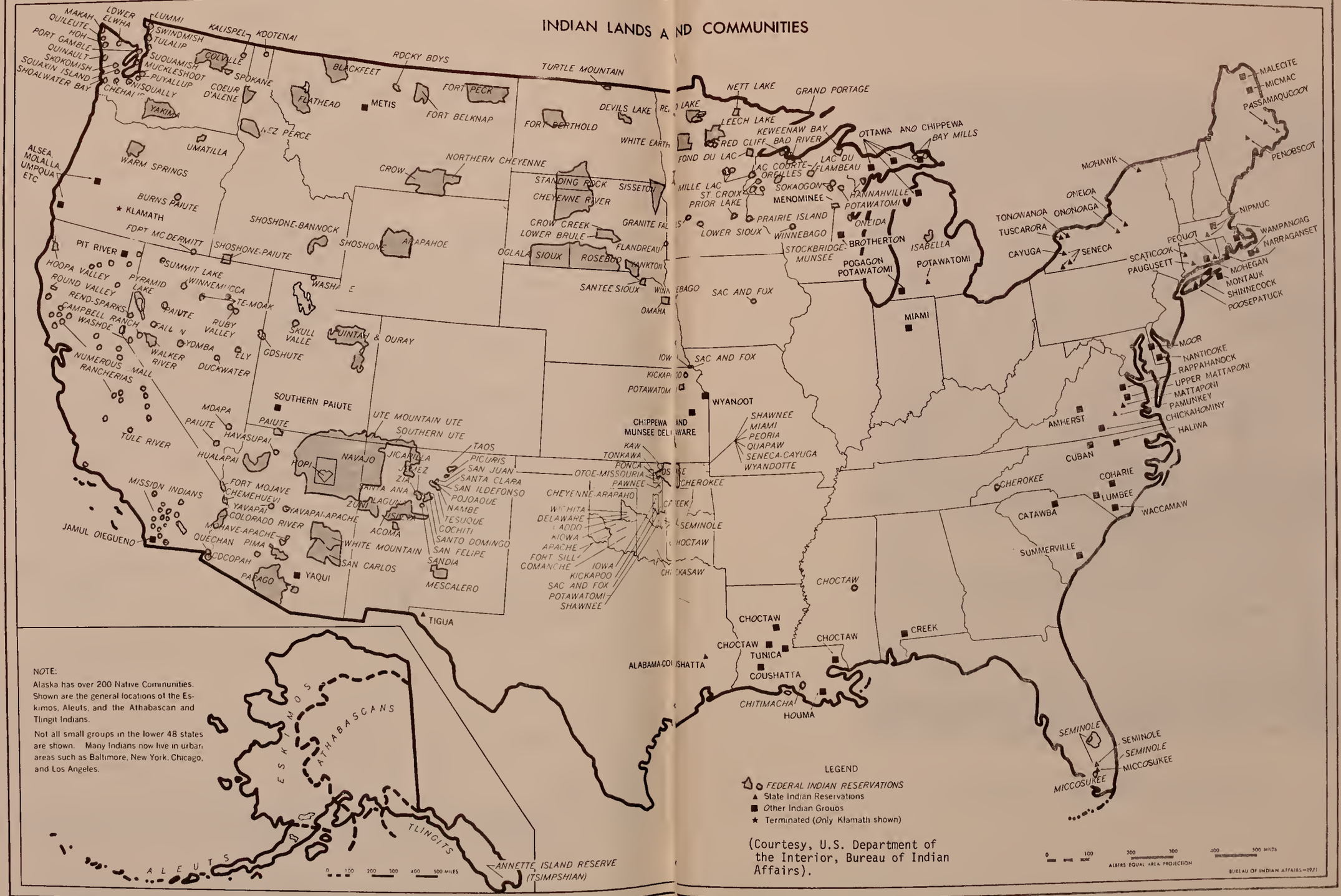
INDIAN LANDS AND COMMUNITIES



(Courtesy, U.S. Department of the Interior, Bureau of Indian Affairs).

Indians in North Carolina fishing with traps, spears, and nets (Artwork by John White, 1585; courtesy, National Archives).

FOREWORD

As a northern midwest farm boy I have vivid memories of an experiment with the American Indian practice, learned from our primers, of placing a fish in each cornhill at planting time. Then seeing my plants flourish I became convinced that the Indians did, in fact, know more about farming than any of us newcomers. Remembering also how my grandmother had adopted the Indian way of drying fruits in the sun, it is with pleasure that I read these papers bringing us the facts about the debt we owe to the people who first farmed on this continent. Again, I compliment the Associates NAL, Inc., for publishing these papers and stimulating our interest in the sources of our bountiful food supply.

by Richard A. Farley
Deputy Director for
Technical Information Systems
of the Science & Education Administration
U. S. Department of Agriculture

(*Encyclopedie Methodique ...*)

INTRODUCTION

From the very beginning in the development of the world food supply, early man was a part of a collectional economy in which he fished, hunted, and gathered food which was necessary to sustain him and which was provided by nature. About 10,000 years ago man's food-processing habits began to include food-producing activities.

Several centuries before the arrival of Columbus in the New World, the first Americans—Maya, Aztec, Chibcha, Inca—were involved in the development of a food supply. Today among the world's total food supply, about half the crops grown were first domesticated by American Indians before the time of Columbus. Indians also acquainted the white man with more than 80 domesticated plants including avocados, cacao, peanuts, peppers, pineapples, sweet or Irish potatoes, pumpkins or squashes, maple sugar, and tomatoes.

Around 1500, an estimated 840,000 Indians were living in what is now the United States. These Indian people were either agriculturists or semiagriculturists— that is to say, while some lived almost entirely on agriculture, others combined hunting and gathering with farming and fishing. From the Atlantic Coastal Plain, to the Southwest and Great Basin, to the northern part of the Pacific Coast and Alaska, the environmental and/or geographical differences played a determining role in the development of agriculture among the many different Indian tribes. Indian corn or maize first developed by the Aztec became a valuable food crop grown along the Atlantic Coastal Plain of North America even before English colonists arrived in 1607. At Jamestown and Plymouth, the utilization of Indian agricultural practices, plants, cultivation, harvesting methods, and processes of food preparation assured a food supply necessary for survival. The early settlers in New England found that Indian corn or maize yielded more food per acre than European grains. With the passage of time, many plants first cultivated by Indians were later produced in greater quantity and improved quality due largely to advanced technologies in farming and in the development of hybrids.

The decade of the 1960's brought a reawakened interest in and plethora of literature on the native American—a kind of information explosion in response to the previous centuries of ignorance and misunderstanding of a people who have made substantial contributions to the advancement of civilization. Alvin M. Josephy, Jr., in his illuminating book entitled, *The Indian Heritage of America* (New York: Alfred A. Knopf, 1969) put it this way:

> Few persons today recognize or are appreciative of the vast contributions made to the contemporary life by the American Indian. All aspects of Indian existence—agriculture, government, religion, trade, mythology, economics and arts and crafts—influenced white men at one time or another and helped to shape the destiny of each of the countries of the Western Hemisphere (p. 31).

Today, the United States is the leading producer of corn as both a cereal and a feed grain. Many of the most widely used and important foods known in the United States and sold in the supermarkets are of American Indian origin. Much remains to be spoken, recorded, and written about the American Indian, especially as pertains to their involvement in agriculture. This special double issue of the *Associates NAL Today* brings together seven papers, selected bibliography, reviews, news, and legislation relating to the involvement of the American Indian in agriculture and will hopefully provide useful information and stimulation for further research.

Editors,
Alan Fusonie
Leila Moran

(Walter's *Flora Caroliniana* ...)

AGRICULTURE IN THE VALLEY OF MEXICO

by

Cecil Harvey*

The Aztecs, like the Spaniards, were late comers to the Valley of Mexico, where Mexico City now stands. In the early 14th century, the Aztecs, then known as the "chichemecs" ("barbarians"), ventured into the Valley of Mexico from an area in northwestern Mexico. In the quest to build their own empire, the Aztecs were guided by their god, Quahcoatle, who according to legend told them to build a city where they found an eagle sitting on a cactus eating a serpent. The Aztecs found what they took to be the site in 1325 and, on an island in Lake Texcoco, began building what became the crowning jewel of all Mexico--Tenochtitlan.[1]

At the center of the city stood giant ceremonial mounds and pyramids painted in lustrous white and decorated with intricate carvings brilliantly colored. Surrounding the temples, the large white palaces with their decorative flower gardens had access to both canals and boulevards. Encircling the palaces were the residences of the artisans and professionals. Made of adobe and then whitewashed, each of these houses had a vegetable garden. In the suburbs, however, could be found the small farmer with his little house and more extensive vegetable gardens.[2]

Of particular importance to the administration of the Aztec state was the tribute gathering process. Tribute covered every Aztec need and luxury--feathers, gold, jade, cotton, rubber, skins, gourds, copal, and obsidian. However, according to Bernal Diaz, Cortez's chief lieutenant, food was the dominant item on the tribute rolls and one of the most important was maize (corn). Maize tribute came from about 28 towns most of which were close by. Such a food item, subject to being consumed by porters if carried distances, could be collected and taken by canoes to nearby towns. The amount of corn gathered in tribute is estimated at about 10,000 American bushels annually per town. Chalco and the Valley of Toluca were exceptions, however, contributing 60,000 and 20,000 bushels, respectively, which put the total maize tribute at well over 300,000 bushels per year.[3] The tribute which was received by a government official, the Chief Speaker, whose duty it was to count and enter it in account books, was distributed among the capulli (tribes) with some stored for use in case of a disaster.[4]

Aztec society as a whole operated for the good of the aggregate, and distribution of the food stuffs and raw materials was on a per capita basis. The Aztecs adopted practices that had been in use long before their arrival in the Valley of Mexico. However, the small gardens, in an area where land was at a premium, could not have supported the population of their city-state. Even the land they reclaimed from marshes soon was diverted to non-agricultural purposes.[5] Once received into the society, raw materials were processed into finished goods and then usually resold to people outside the community.

In a rapidly urbanized society, land was still the basis of wealth. Large agricultural estates lay outside the city. Every married man had a right to the use of state or tribal owned land. Although he could not dispose of the land, he did have the right to pass it on to his descendants. Thus, land could be held by a family for generations. Rights to land could be lost only by failure to use the land for farming for a two year period or by moving from the area. It is not surprising, therefore, that by the time of Cortez, the pressure of population growth had made the lands of little importance for commercial farming.[6]

Recent archeological and archival work in Mexico City has revealed that agricultural plots in Tenochtitlan were not of sufficient size to have produced a surplus. In fact, one theory holds that these plots could support only about 15% of a family's food needs.[7] Plots in the urbanized section of the city were only about 1½ to about 6½ acres. In the southeastern part of the city, the plots were much larger, averaging about 78 acres; but, even with this increase, it is somewhat difficult to believe that this larger acreage under cultivation could have produced much of a surplus. There were, however, about 27 prime agricultural districts in and around the Valley of Mexico, the most productive of which were on the southern perimeter of Lake Texcoco, the area known today as the Xochimilco-Chalco Basin.[8]

Possibly the Aztecs could have extended their own agricultural output by encircling Tenochtitlan with more chinampas. A chinampa is an artificial platform island that is used to grow crops and is a technology that has long been practiced in the Valley of Mexico. These islands are built in long rectangular strips and a farmer may have as many as two or three. Each of these strips of land is completely surrounded by water (Figure 1) enabling a farmer to plant his crops with the use of his canoe. Also there were great ecological advantages in allowing farmers to make full use of the water in the lake.

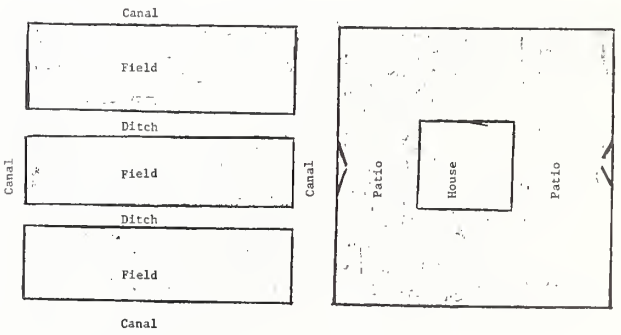


Figure 1. Chinampa and residence.

*Cecil Harvey, Historian, Economics, Statistics, and Cooperatives Service, USDA.

In this type of agriculture, which was designed to capture moisture at root level, standing water was essential. Porosity of the soil allows seepage into the islets and the perpetual moisture allows for a permanent irrigation even in the dry season.[9] These artificial strips are also extremely fertile due to the fact that the mud they comprise is rich in organic nutrients from dead plants, fish, and crustaceans. In fact, when it came time to fertilize a chinampa, the farmers used a combination of compost (aquatic weeds and night soil) and more of the mud with which the chinampa was originally built. Another ingenious invention was the famous floating gardens of Mexico. These were simply rafts or floating seed beds on which seedlings would be planted.[10] The seeding of these floating gardens was so timed that the shoots could be transferred onto the chinampa immediately after harvest.

The most productive area using chinampa farming, according to Pedro Armillas, an anthropologist, was the Xochimilco-Chalco Basin[11] (Figure 2). Here a net productive area of about 36 square miles had a potential of feeding about 100,000 people. Practically all of the food raised here over and above needs for home consumption ended up in Tenochtitlan, either by way of tribute, rent, or the market system. The Xochimilco-Chalco Basin, however, had only seven of the 28 towns paying food tribute.

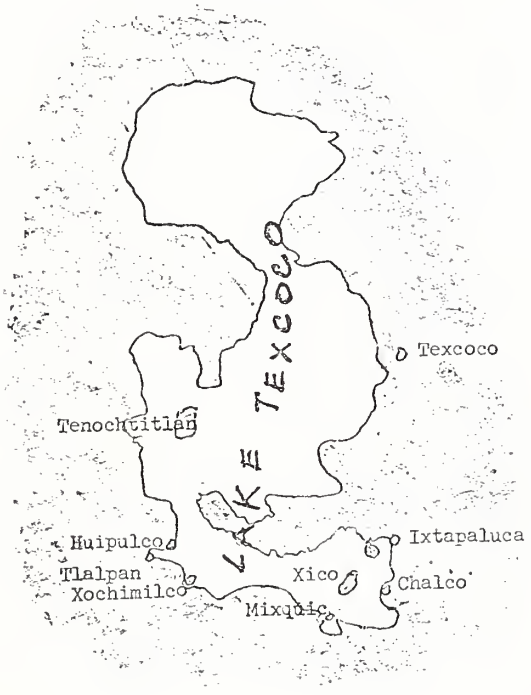


Figure 2. The Xochimilco-Chalco Basin and area.

When Cortez arrived in Mexico, the Aztecs were dependent upon a system characterized by coercion and politics. They had adopted the agricultural practices of the towns and cities they had conquered and the lacustrian, aqueducts, and canal systems. Bernal Diaz, one of the conquistadores, was amazed at the market place in Tlaltelolco, the business center of Tenochtitlan. He wrote, "'When we reached the great square called Tateluco, as we had never seen anything like it, we stood amazed by the infinity of people and goods, method and regularity.'"[12] It was a gigantic market place where as many as 25,000 buyers and sellers, many of them farmers, came every day. On every fifth a "great" market was held attended by as many as 50,000 people.[13] And this was only one of the Aztec markets.

It was soon apparent that the Aztec system and the Spanish colonial program were incompatible. The conquest resulted in the destruction of Tenochtitlan and the enslavement of the Aztecs. The Spanish developed the encomienda system, utilizing slave labor on large estates. Little evidence remained of the Aztec system of chinampas with their complex lacustrian waterworks.

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3. Victor Von Hagen, *Ancient Sun Kingdoms of the Americas* (Cleveland and New York: World Publishing Company, 1961), pp. 171, 172; Edgar Anderson, "The Maize Tribute of Moctezuma's Empire," *Missouri Botanical Garden Annals* 30 (November 1943): 415, 416.

4. Von Hagen, *op. cit.*, p. 172.

5. *Ibid.*, p. 172.

6. Soustelle, *op. cit.*, pp. 79, 80.

7. Edward Calnek, "Settlement Pattern and Chinampa Agriculture at Tenochtitlan," *American Antiquity* 37 (January 1972): 112.

8. Pedro Armillas, "Gardens on Swamps," *Science* 174 (November 1971): 660.

9. *Ibid.*, pp. 653-654.

10. *Ibid.*, p. 653.

11. *Ibid.*, p. 660.

12. Soustelle, *op. cit.*, pp. 25, 26.

13. *Ibid.*

AGRICULTURE AS PRACTICED BY THE EASTERN TIMUCUANS OF FLORIDA: 1564-1590

by

James W. Covington*

Probably the most well-known of the North American Indians that depended upon agriculture during the 16th century were the Eastern Timucuans. Their activities were painted by the French artist Jacques Le Moyne de Morgues who, while serving as cartographer, accompanied the French Huguenot expedition led by Rene de Laudonniere to Florida in 1564.[1] The Flemish artist Theodore De Bry acquired the paintings and narrative from Le Moyne's widow in 1588. He published a book containing the engraved art work and narrative written in Latin at Frankfurt, Germany, in 1591 as part of a general account of travels. In one copy the engravings were colored by an unidentified artist and presented to Prince Maurice of Orange Nassau in 1595. Since that time numerous reproductions of part or all of the Le Moyne collection have been made, including scenes depicting the Timucuans tilling the soil, waging war,

Florida Indians planting maize, 1564; engraving from Theodore De Bry, Grandes Voyages, *1591 (Courtesy, Library of Congress).*

negotiating with the French, fighting an alligator, or other aspects of aboriginal life.

The depicted Saturiba and Utina ceremonies, house types, weapons, and dress were accepted as being reasonably accurate by almost everyone until the 20th century; during the past 60 years, however, the authenticity of some scenes has been questioned. The plates showing Fort Caroline, for example, do not correspond with the description given by Laudonniere.[2] Although the Indians were afraid of snakes, Le Moyne depicts snakes as part of their diet. The size of the leader's house in the middle of the village is too small as portrayed for it was built to hold as many as one hundred persons. Recently other more serious discrepancies have been discovered which include the fact that a Nautilus snail shell had been substituted for a Busycon shell and the French soldiers appeared to be wearing their helmets placed backwards; these errors, however, could be blamed on the engraver.[3]

The people known as Timucuans lived in a general area extending from Cumberland Island and the adjacent Georgia mainland southward into Florida to Cape Canaveral (Kennedy), thence southwestward to Tampa Bay, and, in the northwest, to the Aucilla River. A tentative grouping of the various political units and dialects of the Timucuan language would include three divisions: the Eastern Division, southeastern Georgia and coastal Florida to Mosquito Inlet, and inland along the Saint John's River; the Western Division, a point north of present day Ocala to the Okefenokee Swamp and westward to the Aucilla River; and the Southern Division, present day Ocala southwestward to the Tampa Bay area. The Eastern Timucuans included such confederations of towns as the Potano, who lived in present day Alachua County; the Saturiba, who were centered about Cumberland Island and the mouth and early reaches of the Saint John's River; the Utina, who controlled the area between the Suwannee and Saint John's Rivers, and the Fresh Water Indians, who resided southward along the middle stretches of the Saint John's River.[4] Each of the small villages was ruled by a leader or cacique, but, since a single village actually had little strength, the villages banded themselves together in a confederacy dominated by a major town. The dominance and power of each village and confederacy depended upon its ability to wage battle and survive during an eternal state of warfare. Altogether, there may have been between 5,000 and 8,000 persons in the group known as Eastern Timucuans.[5]

When the Spanish attacked Fort Caroline at dawn on September 20, 1565, it seems improbable that Le Moyne, crippled from a leg wound received in a campaign against the Indians, would have had time to seize any drawings before he climbed the rampart and escaped through the swamps to the coastline where he found a French ship.[6] Therefore, upon reaching France, Le Moyne relied upon his memory and upon accounts written by others as bases for his illustrations. Sometimes Le Moyne used only the accounts for several of the scenes depicted as taking place during the visit of Jean Ribault to Florida in 1562--two years before the coming of Le Moyne to Florida. In addition, the pictures were acquired by Theodore De Bry several years after the death of Le Moyne and errors could have occurred in the transition between the painting and the same engraved scene. No one can check upon the possible errors for only one of Le Moyne's 42 paintings is available.[7]

At first it was difficult to find sources to check Le Moyne or De Bry but in recent years several accounts have been translated and made available to scholars.

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A first rate Spanish view of Timucuan life has become available through the translation and editing of *Francisco Pareja's 1613 Confessionario: A Documentary Source for Timucuan Ethnography*. Another account which has become available is the poem "La Florida" written by Franciscan Friar Alonzo Gregorio de Escobedo during the early part of the 17th century and translated and edited in a version known as *Pirates, Indians and Spaniards*. A third presentation arising from recent archaeological study and interpretation has been included in an article by Jerald T. Milanich entitled "Excavations at the Richardson Site, Alachua County, Florida: An Early 17th Century Potano Indian Village (with notes on Potano culture change)" and found in *Bureau of Historic Sites and Properties, Bulletin No. 2*. All of these accounts make it possible to reevaluate certain features of Eastern Timucuan agricultural practices.

The Timucuan Indians depended upon deer, turtle, fish, maize, beans, and squashes for the staple part of their diet and supplemented such fare with nuts, palm berries, acorn meal, and other types of wild food which could be gathered or caught.[8] When such foods were in short supply and supplies could not be obtained from the storage house, the Indians endured a period of semi-starvation. Hence the planting, cultivation, and harvesting of the maize crop was a most important feature of Timucuan life. Since the sandy coastal soil was poor, usually one crop exhausted the soil in one field and probably it could not support much of a crop in successive years. However, there is no evidence at all in any of the accounts to justify a statement that the medieval practice of allowing one field to remain fallow was followed by the Eastern Timucuans; in more fertile areas where the Creeks lived, they would plant their crops again and again in the same field.

Documentation does not indicate the distance from the fields to the village. The 18th century town of Seminoles at Cuscowilla contained small garden plots near each dwelling but situated two miles away was the common land where each family had a plot and where all inhabitants of the town could cultivate the land.[9] Although one Le Moyne scene shows a fortified village with some evidence of agriculture within the wooden stockade, evidence contained in French sources indicates that the large Timucuan agricultural lands were located in an area distinct from the village site.[10]

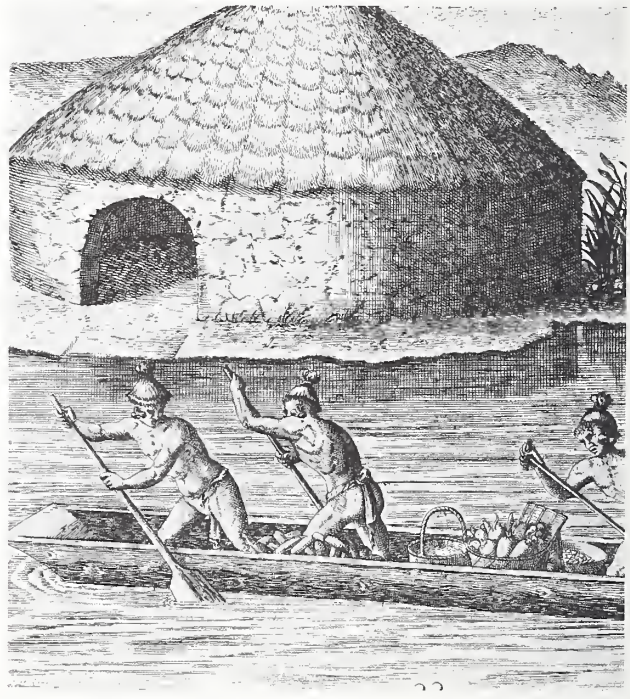
Cultivation of the maize fields involved a rather intricate pattern of organization on the part of all concerned. Criteria for the selection of the village site had included location upon high land adjacent to a lake or sinkhole with good agricultural soils.[11] The leader or most important person in the village was responsible for assembling his people for the task of clearing the fields once or twice each year.[12] Dead maize stalks, grass, and weeds from the fields were gathered, piled, and set on fire to provide a limited amount of fertilizer and to kill off part of the bountiful supply of rabbits which ate the crop.[13]

Before the actual turning of the earth took place, prayers were said by the assembled group. The men cleared away the charred ground covering using hoes or mattocks made of wood and durable fish bones.[14] Then, a special pot of gruel was consumed by six old men.[15] This ceremony was followed by the actual planting of maize kernels by women working in teams; one team used sharp sticks to make holes and the other dropped two seeds into each hole.

Once the planted seeds began to grow it was necessary to protect the tender plants from the birds, rabbits, and other wild animals. One dwelling was erected in the corner of the field to serve as living quarters for those whose duty it was to protect the crops from the animals.[16] If someone who had sowed the field during the past planting or in any other planting died or lightning struck the field, the Timucuans were reluctant to eat maize from that field.[17]

For the Timucuans, crop distribution took place at harvest time. The first ripening maize from an old field or in a new clearing could not be eaten and probably was allowed to remain in the field; all of the remaining crop, however, was eligible for a unique harvest. The village leader would tell the town crier to announce early in the morning that harvest time had come. When the signal to begin was given, the people rushed into the field and began eating quickly as much as possible of the ripened maize. Besides filling their stomachs, the town's people could gather as much maize as they could carry back to their homes where it could be stored for later consumption. Once the signal to cease was given, all had to leave the field or else face punishment.[18]

What was left in the fields was collected and taken to a storehouse made of stones and dirt with a palm leaf roof and erected in a shady spot accessible by water.



Florida Indians storing their crops in the public granary, 1564; engraving from Theodore De Bry, Grandes Voyages, *1591 (Courtesy, Library of Congress).*

Food supplies stored within this granary included wild fruits, berries, smoked fish, game, corn, pumpkins, and beans. A special guard who was subject to the death penalty for neglect of duty protected the gran-

ary. When food was needed in time of drought or war, proper notice was given and a distribution took place according to status. Proper procedures for obtaining food stored in the building included such rituals as prayers given before approaching the storehouse, prayers by the shaman when the building was first opened, and prayers to the first flour ground from maize taken from the granary.[19] Sufficient seeds for planting during the subsequent season were retained by the Timucuans in the storehouse or their own homes. When planting time came virtually all of the maize and beans possessed by the villagers were planted in the ground and the Indians were forced to depend upon fish for food.[20]

There were several ways in which the maize was prepared for consumption. The entire ear of maize was roasted over the fire and used as food during long trips or war parties.[21] Other modes of maize preparation included *tortas o gacha* or cakes and fritters made from pounded, dried, or roasted maize.[22] Another dish was *maize gauchuela* or sofkee, a thin soup-like fare composed of maize and boiled water. There is no evidence to show how the pumpkins or beans were harvested but one of Le Moyne's scenes depicts the crops being taken to the storehouse and a second one depicts raw food being emptied into a large pot placed over a fire. Such food appears to be maize rather than pumpkins or beans.

Recent excavation of a Potano-Alachua site in Alachua County, Florida, has unearthed additional evidence concerning food and agricultural practices of the Indians. The site of the village was on high ground several hundred yards from Orange Lake with a small stream flowing on the western side of the village. Some 15 or 20 circular houses situated about 70 feet apart were included within the village. The houses had vertical posts as supports set two or three feet apart probably with thatched roofs and possibly with wattle and daub side walls. Cooking of food was done within the houses in oval shaped pits nearly two feet wide and almost two feet deep.[23]

From evidence discovered at the site, the food patterns of the villagers were established to some degree. It appears that hunting, fishing, and wild fruit gathering supplemented by maize agriculture was the basis of subsistence. Meat or fish consumed included deer, squirrel, fresh water mussels, turtle, and fish. Other items in the diet included maize, hickory nuts, palm berries, and other cultivated or wild vegetables. Trees left standing within the village may have been used as supports for the storage of maize or for drying racks.

The Eastern Timucuans may have had a primitive way of farming but it was most effective in comparison with that of the French and Spanish who moved into the area during the 1564-1600 period. The French Huguenots, preferring to play the roles of gold seekers and soldiers, rejected the job of farming and obtained needed maize by begging, bullying, or trading with the Timucuans. In contrast, the Spaniards who tried to cultivate the soil found it took six months for the maize to mature with the harvesting of only a few ears. Usually the planted seeds were eaten by blue jays and red winged blackbirds and these same birds ate the tender growing ears. Even when a small crop could be harvested and stored, it was subjected to destruction by grubs, weevils, and worms.[24]

FOOTNOTES

1. Le Moyne was given the job of mapping the coastline and harbors, marking the position of towns, noting the depth of rivers, and portraying the dwellings of the Indians and anything else worthy of notice. Stefan Lorant, editor and annotator, *The New World, The First Pictures of America* (New York: E. P. Dutton and Company, 1946), p. 30.

2. Woodbury Lowery, *The Spanish Settlements within the Present Limits of the United States* (New York: G.P. Putnam's Sons, 1911), p. 58.

3. Jerald T. Milanich and William C. Sturtevant, eds., and Emilio F. Moran, trans., *Francisco Pareja's 1613 Confessionario: A Documentary Source for Timucuan Ethnography* (Tallahassee: Florida Division of Archives, History and Records Management, Florida Department of State, 1972), p. 43.

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6. Lowery, *op. cit.*, pp. 182-184.

7. Lorant, *op. cit.*, p. 32.

8. Jerald T. Milanich, "Excavations at the Richardson Site, Alachua County, Florida: An Early 17th Century Potano Indian Village (with Notes on Potano Culture Change)," *Bureau of Historic Sites and Properties* Bulletin 2 (1972), p. 57.

9. William Bartram, *Travels* edited, with commentary and an annotated index by Francis Harper. Naturalist's ed. (New Haven: Yale University Press, 1958), p. 123.

10. Rene Laudonniere, "History of Florida," translated by Richard Hakluyt in Richard Hakluyt, *The Voyages, Traffiques and Discoveries of Foreign Voyagers* 10, 10 vols. (New York: E. P. Dutton and Company, 1928), p. 45.

11. Milanich, "Excavations at the Richardson Site, Alachua County, Florida," p. 57.

12. The two French accounts are not entirely reliable concerning the practice of planting either once or twice a year. Lowery, probably citing Laudonniere, relates that the maize and beans were sowed in March and in June of each year but Le Moyne states that a November or December planting took place prior to a three month sojourn in the woods. A November planting may have been subject to destruction by the freezes which swept through Florida during the winter months. In the Laudonniere version, after the planting, the Indians retired to the woods where they lived on acorns, reserves of maize, fish, oysters, deer, and turkeys. Probably the sequence of annual planting once or twice depended upon the fertility of soil for in Apalache, an Indian province lying to the northwest and in fertile land, the sowing took place twice a year. One Spanish account stated that land on the Florida

coast was "very barren except where stands the fort of St. Augustine which is good land and there all vegetables and garden stuff being planted." Testimony of Martin Diez, February 4, 1573, in Jeanette T. Connor, *Colonial Records of Spanish Florida: Letters and Reports of Governors and Secular Persons, 1570-1574* (Deland, Florida: Publication of the Florida State Historical Society, 1925), p. 95.

13. James W. Covington, ed., and A. F. Falcones, trans., *Pirates, Indians and Spaniards* (St. Petersburg: The Great Outdoors Publishing Company, 1963), p. 77.

14. Lorant, *op. cit.*, p. 77.

15. Milanich, Sturtevant and Moran, *Francisco Pareja's 1613 Confessionario*, p. 41.

16. Laudonniere, *op. cit.*, p. 47.

17. Milanich, Sturtevant and Moran, *op. cit.*, p. 25.

18. Covington and Falcones, *op. cit.*, p. 148.

19. Milanich, Sturtevant and Moran, *op. cit.*, p. 41.

20. Laudonniere, *op. cit.*, pp. 89, 95.

21. Covington and Falcones, *op. cit.*, p. 154.

22. Charles E. Bennett, comp., *Settlement of Florida* (Gainesville: University of Florida Press, 1968), p. 92.

23. Milanich, "Excavations at the Richardson Site, Alachua County, Florida," p. 55.

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(Robert's ... *Florum Species*)

PROMOTING AGRICULTURE AMONG THE INDIAN TRIBES OF THE OLD NORTHWEST, 1789-1820

by

Richard Farrell*

During the last decade of the eighteenth century the United States government initiated a program designed to civilize the Indians and prepare them for integration into American society. A basic assumption of the project was that Indians could be persuaded to give up their migratory habits and become farmers. Missionaries and others interested in the Indians' welfare had long advocated promoting agriculture among North American tribes, but white policy makers had in general ignored their exhortations. This attitude prevailed until the establishment of the new federal government. Soon afterward, in 1789, Henry Knox, the new Secretary of War and the individual responsible for Indian affairs, outlined for the President broad guidelines of a plan to improve relations with the Indians. How different, he pondered,

> would be the sensation of a philosophic mind to reflect, that, instead of exterminating a part of the human race by our modes of population, we had persevered, through all difficulties, and at last had imparted our knowledge of cultivation and the arts to the aboriginals of the country, by which the source of future life and happiness had been preserved and extended. But it has been conceived to be impracticable to civilize the Indians of North America. This opinion is probably more convenient than just.
>
> That the civilization of the Indians would be an operation of complicated difficulty; that it would require the highest knowledge of the human character, and a steady perseverance in a wise system for a series of years, cannot be doubted. But to deny that, under a course of favorable circumstances, it could not be accomplished, is to suppose the human character under the influence of such stubborn habits as to be incapable of melioration or change--a supposition entirely contradicted by the progress of society, from the barbarous ages to its present degree of perfection.[1]

Details of the program emerged slowly. Instructions to Indian commissioners often directed them to teach Indians "to read and write, to plough, and to sow, in order to raise their own bread and meat, with certainty, as the white people do";[2] in their messages to Congress, presidents called for "rational experiments" to impart to Indians "the blessings of civilization," and asked members to demonstrate "a spirit of equity and humanity toward the aboriginal nationals of America, and a disposition to meliorate their condition by inclining them to be more friendly to us, and our citizens to be more friendly to them."[3] Congress, in considering legislation to regulate trade and intercourse with them and to protect them from white men, periodically allocated funds for the purchase of "useful domestic animals and implements of husbandry" to "promote civilization among the friendly Indian tribes."[4]

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The program gained momentum during Jefferson's administration. A frequent and zealous advocate of agriculture, Jefferson lectured, cajoled, and otherwise tried to persuade Indians and whites alike that peace and friendship could not be established nor maintained until the Indians put down their guns and bows and took up hoes and plows. In his first annual message to Congress, he happily informed members of that body that continued efforts to promote husbandry and household arts among the Indians had "not been without success" and

> that they are becoming more and more sensible of the superiority of this dependence for clothing and subsistence over the precarious resources of hunting and fishing, and already we are able to announce that instead of that constant diminution of their numbers produced by wars and their wants, some of them begin to experience an increase of population.[5]

Jefferson's optimism, however, proved unwarranted. The government continued, expanded, and altered the civilization program during the next 20 years, but it produced few positive results. In January of 1820 John C. Calhoun, Secretary of War, was forced to admit that:

> Although partial advances may be made under the present system to civilize the Indians, I am of the opinion that, until there is a radical change in the system any effort which may be made must fall short of complete success. They must be brought gradually under our authority and laws, or they will insensibly waste away in vice and misery. It is impossible, with their customs, that they should exist as independent communities in the midst of civilized society. They are not, in fact, an independent people, (I speak of those surrounded by our population,) nor ought they to be so considered. They should be taken under our guardianship; and our opinion, and not theirs ought to prevail, in measures intended for their civilization and happiness. A system less vigorous may protract, but cannot arrest their fate.[6]

Although the program in general must be considered a failure, its deficiencies, perhaps, were most glaring in the Old Northwest Territory. There are many reasons for this. In part the failure was due to cultural characteristics of the tribes residing in the territory; more often governmental policies were poorly conceived or contradictory, and government officials were too engrossed with the demands of white society to worry about the Indians.

Among the Indian tribes located east of the Mississippi River, those residing in the Old Northwest were least receptive to the plan. These included the Chippewa, Delaware, Fox, Illinois, Kickapoo, Miami, Ottawa, Potawatomi, Sauk, Shawnee, Winnebago, and Wyandot Indians. Most belonged to the Algonquian linguistic family, the Winnebagoes (Siouan linguistic family), and the Wyandots (Iroquoian linguistic family) being exceptions. Although all migrated freely within and in and out of the territory, the Old Northwest was apparently home for some of the tribes. Others, specifically the Delawares, Ottawas, Shawnees, and Wyandots, were driven into the region by Iroquois war parties or crowded there by the pressure of white settlements.[7]

Historically none were agriculturists. They were more inclined to depend on hunting and fishing for their food supply than the more sedentary Iroquois or southeastern tribes. Abundant game, excellent fishing, and natural edible vegetation, combined with thin soils, short growing seasons, and an unfavorable climate, at least in the upper half of the Old Northwest, discouraged "garden" agriculture. Corn in particular but also beans, squash, and pumpkins were sometimes cultivated in a primitive fashion, but essentially the tribes were forest people depending on the forest for their sustenance.[8] As one contemporary observed, Algonquian tribes "supported themselves by hunting alone, despising agriculture as a pursuit little suited to their ambitious pride and regarding it as infinitely beneath them."[9]

After white men began to push into the interior, Indian tribes in the Old Northwest were even less motivated to take up the hoe and plow. As contacts between the two groups became more frequent each, for a time, became increasingly dependent upon the other. White men needed the Indians to maintain their military and economic hold on the territory and were willing to supply their allies with necessities. In turn, Indians quickly learned to want and to become dependent upon white men's gifts. One military commander complained that:

> ...the Indians must have presents[.] [W]henever we fall off from that article they are no more to be depended upon. The past is soon forgot by them except when they do us a favor. Give the Indians of this country a present and they will immediately strive to make some trifling return, which we must however give them four times the value for.[10]

Both anthropologists and historians have pointed out the adverse effects of this arrangement. In practical terms, the white men needed Indians only as long as they could supply furs or fight. When these services were no longer required, the gifts stopped, and the Indians "were forced to other expedients so as to assuage their insatiable wants for Euro-American products. At this time (in the 1790's) they started living off their capital, by leasing and selling tracts of land."[11] In psychological terms, it was a major factor in the disintegration of Indian culture. Bernard Sheehan has pointed out that:

> First materially and then gradually in the arts necessary for survival, the native society became helpless without the aid of civilization. Everywhere the natives were eager for new things; but they soon lost the capacity to thrive in the old way, and they often did not absorb the competence for the efficient manipulation of the white man's world. . . . The natives instinctively recognized the superiority of the white man's ability to manage his environment, and they showed few inhibitions in applying to him for help. Slowly both Indian and white came to realize that the more the Indian accepted help, the less he could help himself. Long before the close of the Jeffersonian period, Indian society had become a satellite of the white man's culture.[12]

The factory system established by the United States only compounded the problem. Approved by Congress on an experimental basis in 1796, the program was renewed periodically until 1822 when it was abolished.[13] Advocates of the system hoped to gain the friendship of the Indians by protecting them from the abuses and dishonesty often associated with trading arrangements made with private traders and fur companies. This was to be accomplished by giving the government a virtual monopoly over trade. Under government supervision, the factories would diminish foreign influence over the Indians and possibly force British traders from the area; the presence of Indian agents would reduce the dangers of frontier warfare, and the factories would supply those goods upon which the Indians had become so dependent.[14]

The system tended in practice if not by design to nullify efforts to promote farming. In arguing for its continuance, Jefferson pointed out to Congress that by encouraging agriculture Indians would see how useless their "extensive forests" were to them and that by establishing trading houses Indians would soon accept "the wisdom of exchanging what they can spare and we want, for what we can spare and they want."[15] One program reinforced the other. The Indians, however, apparently convinced that it was easier to obtain the essentials of life from trading houses than to take up farming, rejected Jefferson's logic. In 1808, for example, the Indian agent at Fort Wayne reported issuing provisions amounting to:

	Lbs. of Bread	Lbs. of Beef	Lbs. of Pork	Qts. of Salt	Qts. of Whiskey	Rations of Bread	Rations of Meat	Complete Rations
Jan.	668	158	38	21	53	31	31	. . .
Feb.	615	..,	10	9	8	29	29	. . .
March	1032	94 2/4	444	14	55	31	31	. . .[16]

At the same time, Secretary of War Dearborn worried about a report that the Potawatomies and other tribes had been so negligent in providing for their needs that they were in danger of starving.[17]

In attempting to determine how accurate the report was, Dearborn demonstrated his awareness of another potential weakness in the factory system. After requesting an agent to investigate the plight of the Potawatomies, he confided his suspicion that the agent at Fort Wayne, William Wells, was exploiting the Indians:

> I fear that he calculates making money by supplying the Indians. I have no doubt of his improper interference with the intentions of the Government to aid the Indians through Wm. Kirk [a Quaker missionary]. Wells, under cover of different pretenses, dissuaded the Miamis and Puttawatomies [sic] from receiving any assistance in the agricultural pursuits from Kirk, and the men employed under him, and I am satisfied that for several years past, Wells has been very interested on making money and is at the same time very jealous of any interference with his concerns with the Indians in the Agency.[18]

Whether Wells was guilty or not is not pertinent.[19]

What is important is that agents assigned to various factories could thwart the government's efforts to promote agriculture, and some undoubtedly did for personal gain.

Those best qualified, perhaps, to teach farming techniques to the Indians were missionaries.[20] Organized missionary societies apparently had little interest in working with tribes in the Old Northwest during the early decades of the 19th century. The interdenominational American Board of Commissioners of Foreign Missions, organized in 1810 and soon afterwards dominated by the Congregationalists, initially decided that it should devote its energy and resources to heathens in the "Eastern World" rather than "the aboriginal tribes of North America." A few years later, when the Board became active in the United States, most of its early work was confined to southern tribes.[21] Other Protestant denominations, such as the Baptists, Methodists, and Episcopalians, did not establish missionary societies until after the War of 1812. By the time they were ready to sponsor missions, the government was ready to abandon its efforts to promote agriculture in the Old Northwest.

The Moravians' Helpers' Conference, which served both local congregations and Indian missions, sponsored one of the first Protestant missions north of the Ohio River. Established in May 1801, the White River Mission existed until September 1806. During that time, its small band of dedicated missionaries worked primarily with the Delawares, bringing them both the gospel and white men's farming practices.[22] A variety of circumstances hindered their efforts including the apparent lack of enthusiasm among government officials for their project. In a letter to the Secretary of War, the territorial governor, William Henry Harrison, noted the arrival of the Moravians and forwarded a request from the Delaware chiefs that part of their annuity be paid in agricultural implements and cattle and hogs. Seemingly, however, he was far more interested in obtaining military uniforms for various chiefs than in providing them with farming tools:

> I am convinced that nothing would please the Chiefs of all the Nations so much as a distinction of this kind. It was a method always persued by the British and nothing did more to preserve their influance. I therefore take the liberty of recommending that about a half dozen Coats made in the uniform of the United States and ordinary Cocked Hats may be sent for each of the nations who have an annuity of one thousand dollars, and Half that number for the Nations who receive 500 dollars--the expence to be taken from the allowance of each nation.[23]

The failure of the Indians to respond and the insurmountable problems the missionaries encountered were probably more influential in the decision to close the mission than was Harrison's lack of interest.[24] Equally important, the difficulties that the Moravians experienced may help explain why other denominations were reluctant to take on the task of teaching about God and agriculture to the Northwest tribes. One of the White River missionaries surely expressed the ambivalence shared by all when he wrote:

> Greatly as we desired to leave here after all we have had to suffer, it came as a surprise to us all to hear that the Saviour had directed to give up this post. We felt very sad over it in the beginning, especially when we recalled all the struggles, trials, and tribulations, which we had to pass through during these last years. We deeply regret that the object of this mission cannot be attained, and that it has to be given up after all the heavy labors and expenses. When we thought of all this nothing comforted us but the knowledge that all was done in accordance with the gracious leading of the dear Saviour. Into His hands we commit our seedtime of tears. Our fervent hope is that there may after all come a time that the seed sown will bear fruit and the heathen who are still in the deep sleep of sin may become a reward for His sufferings.[25]

Some religious groups, particularly the Catholics, Quakers, and Moravians, supported individual or itinerant missionaries who played a role in the government's civilization program. Although different denominations debated whether Indians should first be Christianized or civilized, all

> chose agriculture as the ideal employment for their charges, for above all work, farming received God's smile. It encouraged private property, which in turn spurred industry. Farming also provided a stable basis for organized society and civil government. Missionaries thus saw rural life as providing the proper social foundation for their ultimate goal for the self-sustaining church.[24]

With varying degrees of success, they attempted to teach Indians how to build log cabins and operate saw mills and gristmills; they provided tools and livestock, and they showed them how the white man planted and harvested his crops.

Because of the contacts these missionaries had established, government officials began to turn to them for assistance. Secretary Knox had recommended in 1789 that the government provide missionaries with tools and livestock and send them to work with friendly tribes.[25] At first, missionaries were used on a limited basis as interpreters or observers in treaty negotiations. Even then they were told that they were not "to confer with the Indians upon any subject of importance, until they [had] previous communicated the same" to the government's commissioners.[26] Later the government subsidized individual missionaries who were willing to promote and teach farming practices to the Indians.[27] On one occasion, at least, negotiators agreed to provide $100 a year for seven years to be used toward the support of a priest for the Kaskaskians since this tribe had been "baptised and received into the Catholic church."[28]

The federal government also tried to stimulate an interest in farming when it negotiated treaties with various tribes. Beginning in 1791, Indian commissioners offered to "furnish gratuitously" to the Cherokees "useful implements of husbandry" so that they might "be led to a greater degree of civilization." A few years later negotiators were more generous. They agreed to give the Six Nations tribes an annual allowance of $4,500 to "be expended yearly forever, in purchasing clothing, domestic animals, implements of husbandry, and other utensils suited to their circum-

stances and in compensating useful artificers." The Greenville Treaty of 1795 provided the various signatories with an option to take part of their annuities in domestic animals, agricultural tools, and other useful utensils.[29]

Government agents continued to offer optional arrangements for annuity payments after the turn of the century and occasionally other incentives were added. The Delawares, for example, received an additional $300 per year for ten years which was to be used exclusively for "ameliorating their condition and promoting civilization" plus $300 a year for five years to be used to employ individuals who would teach the tribe "to make fences, cultivate the earth, and such of the domestic arts as are adapted to their situation."[30] In other treaties the government agreed to send blacksmiths to different tribes for specified periods of time and to erect both saw-mills and gristmills.[31]

Historians have long debated, defended, and attacked the government's motives in these negotiations.[32] Regardless of their conclusions, the fact remains that both those who made policies and those who implemented them were willing to and did sacrifice the integrity of their program and the welfare of the Indians to meet the ever-increasing demands of frontiersmen for land. Even if tribes in the Old Northwest had been receptive to the idea that they become farmers like the white man, the pressures exerted against them precluded their acceptance of it.

During the early 1790's, "the essential interests and dignity of the United States" always seemed to frustrate "amicable" negotiations, and the Army was forced "to act offensively."[33] Open conflict was temporarily suspended in 1794 after the Battle of Fallen Timbers. Although Secretary of War Timothy Pickering insisted in his instructions to General Wayne that "peace and not increase of territory has been the object of this expensive war," the terms of the Treaty of Greenville (1795) gave the United States extensive lands in what is now southern and eastern Ohio and southeastern Indiana—more, in fact, than Pickering had originally suggested in his instructions to Wayne.[34]

For the next few years government officials tried to deal fairly with the Northwest tribes. Then, midway through his first administration, Jefferson seems to have clarified his priorities. Concerned over persistent rumors that Spain planned to retrocede the Louisiana territory to France and fearing French influence in the Old Northwest, he had Secretary of War Dearborn write Harrison in June 1802 urging him not only to accelerate his efforts in defining the boundaries established by the Treaty of Greenville but also to advance American claims to as much land as possible.[35] Less than a year later, Jefferson wrote Harrison privately urging even more vigorous action. He warned Harrison that:

> The crisis is pressing. Whatever can now be obtained, must be obtained quickly. The occupation of New Orleans, hourly expected, by the French, is already felt like a light breeze by the Indians. You know the sentiments they entertain of that nation. Under the hope of their protection, they will immediately stiffen against cessions of land to us. We had better therefore do at once what can be done now.[36]

Harrison accepted his assignment with a vengeance. Beginning in 1802 at a meeting with Indian chiefs in Vincennes over the Greenville boundaries through 1809 when he negotiated the Treaty of Fort Wayne, Harrison threatened, coerced, and bribed Northwest tribes into ceding extensive tracts in what would become Ohio, Indiana, Illinois, and Michigan. By 1809, after the Treaty of Fort Wayne, it was clear that Indians would not be allowed to remain in their homeland much longer.[37] After all this, Jefferson could still say to the chiefs of Wyandots, Ottawas, Chippewas, Potawatomis, and Shawnees:

> If you become farmers and raise cattle, hogs, sheep, fowls, and such things to spare, you can immediately exchange them for clothing and other necessaries. I am satisfied, therefore, my children, that the accommodating us with that land was as beneficial to you as to us. But, notwithstanding, I believe it to be better for you to sell your surplus lands from time to time; yet I repeat to you the assurances that although we may go so far, sometimes, as to say we would be willing to buy such a piece of land, yet we will never press you to sell, until you shall desire yourselves to sell it.[38]

In fact, the sequel to the Treaty of Fort Wayne was the Battle of Tippecanoe.[39]

Following the War of 1812 the government renewed its aggressive land-acquisition policy.[40] At the same time new programs were initiated, some designed to educate Indian children and others intended to encourage agriculture and the mechanical arts among adults. Missionary and other "benevolent" societies also became actively involved in the education process, and Indian agents provided tools and hired hands to help the Indians with clearing, fencing, plowing, and planting.[41]

Still, by 1820, more and more people were convinced that removal was the only acceptable solution—the frontiersmen because they wanted the land, the policy makers because they now believed that the "slow process of education, civilization, and Christianization" could only take place when the Indian was removed from the influence of the whites."[42]

The decision by those who formulated Indian policy to submit to the demands of the frontiersmen for land doomed the civilization program. Although most thought initially that they could persuade Indians in the Old Northwest to accept the white man's way of life, this was neither practical nor possible because of the hostility their policies and actions created. The Indians had no interest in farming to begin with, and the pressures exerted by policy makers and settlers left them no time to discover its advantages.

FOOTNOTES

1. *American State Papers, Documents, Legislative and Executive, of the Congress of the United States,* Class II, Indian Affairs, Vol. I (1832), 53.

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3. George Washington, Third Annual Address, October 25, 1791; John Adams, Inaugural Address, March 4, 1794, in James D. Richardson, comp., *Messages and Papers of the Presidents*, Vol. I (1909), pp. 104-5, 231.

4. An Act to Regulate Trade and Intercourse with the Indian Tribes, March 1, 1793, *The Debates and Proceedings of the Congress of the United States . . . and All Laws of a Public Nature*, Second Cong., October 24, 1791 to March 2, 1793, Vol. III (1849), p. 1444.

5. Thomas Jefferson, First Annual Message to Congress, December 8, 1801, in Richardson, *op. cit.*, I. p. 326.

6. John C. Calhoun, Secretary of War, "Report on Progress Made in Civilizing the Indians," January 15, 1820, *State Papers*, Indian Affairs, II, 200-201.

7. John R. Swanton, *The Indian Tribes of North America*, Smithsonian Institution Bureau of American Ethnology *Bulletin* No. 145 (Reprinted 1968), pp. 54, 230-260.

8. See: Charles Hudson, *The Southeastern Indians* (1976), 288-299; Frederick W. Hodge, ed., *Handbook of American Indians North of New Mexico*, Smithsonian Institution Bureau of American Ethnology *Bulletin*, No. 30 (Reprinted 1968), Part I, 615-619, 38-43; A. E. Parkins, "The Indians of the Great Lakes Region and Their Environment," *The Geographical Review* 6, 6 (December 1918), 510.

9. Nicolas Perrot, *Memoir on the Manners, Customs, and Religion of the Savages of North America*, in Emma H. Blair, ed., *The Indian Tribes of the Upper Mississippi Valley and Regions of the Great Lakes* (1969 edition), I, p. 43.

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11. John A. Clifton, *The Prairie People, Continuity and Change in Potawatomis Indian Culture, 1665-1965* (1977), p. 127.

12. Bernard W. Sheehan, *Seeds of Extinction, Jeffersonian Philanthropy and the American Indian* (Chapel Hill: University of North Carolina Press for The Institute of Early American History and Culture at Williamsburg, Va., 1973), p. 223.

13. *Debates and Proceedings of the Congress of the United States . . . and All the Laws of a Public Nature*, Fourth Cong., 2nd Sess. (1849), pp. 2889-2891.

14. See: Francis Paul Prucha, *American Indian Policy in the Formative Years: The Indian Trade and Intercourse Acts 1790-1834* (Lincoln: University of Nebraska Press, c1962, 1970), Ch. V.

15. *American State Papers*, Indian Affairs, I, 684.

16. Clarence E. Carter, *The Territorial Papers of the United States, The Territory of Indiana*, Vol. VII (Washington, D.C.: U.S. Government Printing Office, 1939), p. 542.

17. Secretary of War to John Johnson, Indian Agent, March 1808, Letters sent by the Secretary of War, April 23, 1804-July 5, 1809, Microfilm M-15, Roll 2, p. 361.

18. *Ibid.*

19. See: Joseph A. Parsons, Jr., "Civilizing the Indians of the Old Northwest, 1800-1810," *Indiana Magazine of History*, LVI, No. 3 (September, 1960), pp. 207-213.

20. Robert F. Berkhofer, Jr., *Salvation and the Savage, An Analysis of Protestant Missions and American Indian Response, 1787-1862* (New York: Atheneum, c1965, 1972), pp. 70-72.

21. *First Ten Annual Reports of the American Board of Foreign Commissioners for Foreign Missions, with Other Documents of the Board* (1834), p. 18. See also pp. 231-245.

22. Lawrence H. Gipson, ed., *The Moravian Indian Mission on White River, Diaries and Letters, May 5, 1799 to November 12, 1806*, Indiana Historical Commission *Collections*, XXIII (1938), pp. 11-19.

23. Harrison to the Secretary of War, July 15, 1801, in Logan Esarey, ed., *Messages and Letters of William Henry Harrison*, Vol. I, 1800-1811, in Indiana Historical Commission *Collections*, VII (1922), p. 30.

24. See: "Diaries of the Little Indian Congregation on the White River for the Years 1801-1806," Gibson, ed., *The Moravian Indian Mission, ad passim.*

25. Knox to Washington, July 7, 1789, *American State Papers, Indian Affairs*, I, p. 54.

26. Instructions to . . . Commissioners appointed for treating with the Indians Northwest of the Ohio, April 26, 1793, *Ibid.* p. 341.

27. See: Secretary of War to Israel Whelan, March 19, 1801, Letters sent by the Secretary of War, Indian Affairs, 1800-1824, Microfilm, M-15, Roll 1, 28; Secretary of War to Wm. Ewing, March 18, 1805. *Ibid.*, M-15, Roll 2, 46; Secretary of War to Catharine Shaw, August 18, 1806, *Ibid.*, M-15, Roll 2, 248. See also Parsons, "Civilizing the Indians," *Indiana Magazine of History*, p. 206.

28. Charles J. Kappler, ed., *Indian Affairs, Laws and Treaties* (Washington, D.C.: U.S. Government Printing Office, 1904), pp. 67-68.

29. *Ibid.* pp. 31, 36, 42.

30. *Ibid.* p. 70.

31. See *Ibid.*, pp. 93, 149, 173.

32. See: Bernard W. Sheehan, "Indian-White Relations in Early America: A Review Essay," *William and Mary Quarterly*, 3rd Series, XXVI (April, 1969), 267-286.

33. George Washington, Fifth Annual Address to Congress, December 3, 1793, in Richardson, *op. cit.*, I, p. 141.

34. Quotation from Reginald Horseman, *Expansion and American Indian Policy, 1783-1812* (1967), p. 100. See also *Ibid.*, p. 101.

35. Secretary of War to William Henry Harrison, 17 June 1802, Letters sent by the Secretary of War, Indian Affairs, Nov. 17, 1800-April 20, 1804, M-15, Roll 1, pp. 233-234.

36. Jefferson to Harrison, February 27, 1803, Esarey, ed., *Messages and Letters of William Henry Harrison,* I, p. 73.

37. See: Horseman, *Expansion and American Indian Policy;* Chs. IV and IX *ad passim*; Dorothy Burne Goebel, *William Henry Harrison, A Political Biography*; Indiana Historical Commission *Collections,* Vol. XIV (1926), Ch. IV, *ad passim.*

38. Albert Ellery Bergh, ed., *The Writings of Thomas Jefferson,* XIV (1903), pp. 469-70.

39. Goebel, *Harrison,* p. 115.

40. See: George Dewey Harmon, *Sixty Years of Indian Affairs: Political, Economic, and Diplomatic, 1789, 1850* (1941), pp. 137-142.

41. *Ibid.,* Ch. XIII *ad passim*; Prucha, *American Indian Policy,* pp. 219-224; Nellie Armstrong Robertson and Dorothy Riker, eds., *The John Tipton Papers,* I, 1809-1827; Historical *Collections,* XXIV (1942), pp. 347-48, 434, 492-3.

42. Prucha, *American Indian Policy,* p. 225; William T. Hagan, *American Indians* (Chicago: University of Chicago Press, 1961), pp. 66-91.

Pisehedwin, a Potawatomi, and others in front of his Kansas farm home, 1877 (Courtesy, National Archives).

U.S. DEPARTMENT OF AGRICULTURE ACTIVITIES IN NAVAJOLAND: THE 1930'S

by

Gerald R. Ogden*

The Navajo Nation as an agricultural society is now pursuing its fourth century of development. Originally an indigenous culture whose efforts were devoted to hunting and gathering, tribal lifestyle underwent a radical transition in the middle decades of the 17th century when the Navajo became a mounted horse-oriented people as a by-product of the Spanish *entrada* into the southwest. By 1680 or shortly thereafter, the Navajo added sheep and other animals to their herds when the Spaniards abandoned their livestock during the retreat from the Pueblo Revolt.

From the latter part of the 17th to the middle of the 18th centuries the Navajo herds, particularly the sheep, multiplied many times, and the Dineh (the People) became increasingly dependent upon a livestock economy. Ownership of animals influenced their dietary habits, dress, migratory practices, and attitudes towards wealth. When they were captured and subjugated by the U.S. Army early in 1864, the Navajo lost their flocks.

Later the Navajo returned to their homeland and reestablished their herds, using as a foundation the small allotment of 30,000 sheep and 4,000 goats issued to the tribe under the Treaty of Peace of 1868. The Navajo Nation once again became a livestock oriented culture, subject to the instabilities of a sheep economy. Over the next 50 years population growth, greatly increased herd size, and adverse climatic conditions placed inordinate pressures on the land base; inbreeding caused stock degeneration; the market value for animals and wool declined, and an already poor economy fell to a substandard existence for the people. A Bureau of Indian Affairs agent summarized the Navajo's position by stating that "They are poor and getting poorer . . . [what is needed are] fences, ditches, seeds . . . the introduction of a cross-breed of sheep, and the compulsory exchange of large numbers of worthless ponies for sheep and cattle."[1] Yet the Navajo largely resisted efforts of the federal government to improve the economy through the control of disease, the importation of blooded stock, and diversification through an expansion of farming.

Sheep and burro on the Navajo Reservation in the 1960's (Courtesy, Bureau of American Indian Affairs—Department of the Interior).

But the government persisted. In the quarter of a century prior to 1930, the Bureau of Indian Affairs and the Department of Agriculture, in cooperation with the Navajo Nation, combined their expertise to eradicate sheep scabies and dourine from horses; introduced new plants; protected fields from rodents and insects, and

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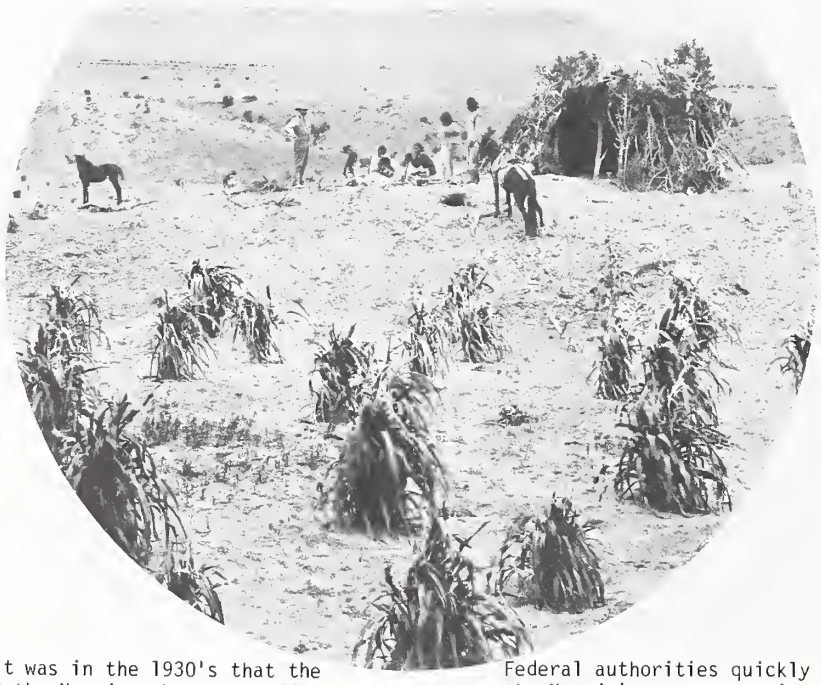
made limited attempts to introduce improved farming and home improvement techniques through the use of visual aids and literature. Although reluctant, the Navajo adopted some aspects from each of these programs. In a sense, the years preceding 1930 served as a preparatory period—a time of examination and of seeking resolutions to the problems of the Navajo community—during which a foundation for future programs of cooperative action could be built. Such actions were critically needed for the events that awaited the Navajo in the decade ahead.

A DECADE OF CHANGE

Unquestionably the 1930's may be considered one of the most traumatic periods in Navajo history. Perhaps in some small measure it can even be equated with their capture and detention in New Mexico during the middle of the 19th century. For it was in the 1930's that the federal government directed the Navajo, who were suffering from drought conditions and entangled in the upheavals of the nation's economic plight, to reduce their livestock in an effort to save their range resources. The livestock reduction program presented a challenge to both the Navajo and government officials, for the Tribe's economic survival depended upon their herding of sheep. The program also changed many customs and social mores surrounding the Indians and their animals. To separate the man from his herd required empathy, tact, and hard work on the part of federal authorities. But often these qualities were not displayed. Misunderstandings occurred and the Navajo, viewing the government's efforts with suspicion, resisted projects designed for their benefit. Judging from the results of the efforts expended in the 1930's, as viewed in retrospect, it must be assumed, however, that the benefits to the Tribe more than outweighed the anxieties experienced by them.

Few times in American history has there occurred an opportunity for controlled change like the Navajo rehabilitation program of the 1930's. The ingredients were there: a largely unassertive population who looked to the federal government as its benefactor; a President, reacting to America's economic plight, who desired to rehabilitate the Indians, both socially and economically; congressional support, through the allocation of monies; a people in need, and government resources of a nature and degree of sophistication that could help insure the success of projects.

First, however, it was necessary to determine what problems the Navajo were experiencing in order to outline programs to solve the problems, and implement systems to carry projects through to their conclusions.



Navajo hogan and cornfield near Holbrook, Arizona, 1889 (Photo by F. A. Ames; courtesy, National Archives).

Federal authorities quickly determined the cause of the Navajo's poor economic status—the land base was insufficient to support the size of the livestock population. In appraising the situation, E. R. Fryer, Superintendent of Indian Affairs on the Reservation, noted that 10,000 Navajo families lived on grazing resources capable of supporting a population of about 600 sheep-raising white families.[2] A large population growth, from 8,000 in 1868 to approximately 50,000 in 1935, and an extraordinary multiplication in the size of livestock herds—to over a million head of sheep and goats plus cattle and horses—resulted in overutilization of the land. Of equal consequence though was the fact that, prior to 1930, little was accomplished in preserving the resources that were available.[3]

The lack of optional means of producing income for Navajo families compounded the problem of the poor

resource base. The sale of handicrafts generated minimal income and then only to a limited number of families. On-reservation employment was low and less than off-reservation opportunities. Agricultural output, other than livestock, remained below subsistence level, with only one-quarter of one percent of the reservation being cultivated.[4] A survey determined that per capita annual cash income averaged less than $100 per year while consumption group income remained about $500 per year.[5]

The federal government faced a complex problem since it was not a situation in which rehabilitation of the land base alone would satisfy Navajo needs. Although it was of primary importance to restore the land base, at the same time it became essential that the land restoration program be accompanied by projects to aid in human adjustment. Specifically, it meant that a reduction in the number of livestock should be accompanied by a range restoration program. Income from stock raising needed to be maintained or increased despite reduction in stock levels. The Navajo had to be introduced to and educated in new techniques in livestock breeding and range management in order to preserve the land base following restoration. The economy had to be adjusted to relieve the Tribe's dependency on a single source of income—livestock.

The true nature of the depletion of the range did not become known until 1930 and it was not until some time later that experts on soil erosion and conservation within the Department of Agriculture were summoned for advice. William H. Zeh, an Indian Service forester, had conducted a survey in 1930 and concluded that the range was seriously overstocked. He suggested that rehabilitation be undertaken. No serious efforts were extended in this direction, however, until after a three year delay; following the appointment of John Collier as Commissioner of Indian Affairs, the Indian Office did initiate a plan. Collier's first action called together a group of experts, mostly from the Department of Agriculture, but also from the Indian Service.[6] Forming a committee known as the Conservation Advisory Committee for the Navajo Reservation, the investigators conducted a survey of the range and promptly submitted its findings to the Indian Office.[7] The report gave credence to Zeh's earlier findings and stressed the importance of taking immediate remedial action.

The first steps in stock reduction followed in a flurry of activity. To partially compensate for the Navajo's loss of income, authorities initiated emergency conservation work utilizing federal funds and supervision, and using Indian labor. To help cure the land of its ills, the following steps were taken: roads were built; some fire control measures were implemented to protect the forests; the Bureau of Biological Survey of the Department of Agriculture conducted rodent control operations; fences were constructed, and soil erosion measures were implemented. The Department of Agriculture then transferred Hugh Bennett, one of the foremost experts on soil erosion, and other staff personnel to the Department of Interior where, on September 19, 1933, the Soil Erosion Service was established. As Solon Kimball later stated, Bennett, who headed the Soil Erosion Service, recognized that soil depletion had progressed so rapidly "as to threaten the existence of the Navajo people," and that "the magnitude of possible erosion control [was] beyond all practical consideration."[8]

Although approximately 81 percent of the 15 million acres on the reservation were "over-utilized,"[9] insufficient funds, manpower, and equipment prevented the massive undertaking of either restoring the entire range or implementing extensive erosion control measures. Commissioner Collier advanced the idea, therefore, that projects should be designed with the idea that the federal government would help the Navajo to help themselves.[10]

Federal experts focused their attention on providing education by demonstration; for instance, they propagated plants to control erosion and conducted research and breeding experiments to improve livestock. With the cooperation of the Navajo Tribal Council, they set areas aside for the purpose of demonstrating to livestockmen that under certain conditions larger sheep could be grown which, in turn, could produce more wool and suffer less mortality in lambing, while simultaneously preserving the range. Mexican Springs became the first demonstration area and projects at Kayenta, Chilchinbitoh, Steamboat Springs, Ganado, Moenave, and Klagetoh followed. It became official policy to employ Navajo at these sites for the purpose of exposing them to the meaningful task that lay ahead.

In the Tribal Council Meeting at Keams Canyon, Arizona, in July 1934, federal spokesmen told representatives of the Tribe that floods caused considerable damage to their grazing lands. Besides creating the great gullies that marred the landscape, flood waters also washed away much vegetation. Bureau of Plant Industry

A Navajo shepherd tends his flock which is pastured on the reservation in a deep arroyo at Pinon, Arizona (Courtesy, Bureau of Indian Affairs—Department of the Interior).

personnel, working cooperatively with the Bureau of Indian Affairs, the Soil Erosion Service, and various experiment stations, envisioned that this situation might be alleviated by the cultivation of range grasses under controlled conditions using seed distribution.[11] Permission was also asked of the Council for the estab-

lishment of a nursery to grow flood retarding plants. Tribal representatives voiced no serious objection to the plan and voted to provide 135 acres of Tribal land for the nursery.[12]

The Department of Agriculture achieved limited success in propagating and distributing nursery-produced plants for erosion control and flooding. Given the limited amount of time and the magnitude of the job, Department personnel decided to phase out the operation and, in 1939, the administration of the nursery was transferred from the Soil Conservation Service to the Bureau of Indian Affairs in exchange for certain property at Mexican Springs.

The construction of another research facility, established for the purpose of eliminating the contradictions existing within the Navajo sheep industry, paralleled the building of the nursery. Beginning with their return to Navajoland, the Tribe depended upon the marketing of sheep and sheep products as their major source of income. The Indians, however, equated the number of

Navajo women shearing sheep (Courtesy, National Archives).

sheep grown, rather than their quality, as a measure of wealth. The numbers of animals increased prodigiously, therefore, but because of inbreeding their quality declined. The normally wiry longlegged ungulates, environmentally conditioned to grazing on the sparse vegetation of the arid West, became even more gaunt. As a meat animal they became inferior. And the long, greasy, uneven quality of the wool proved an anathema to the commercial wool industry.

As opposed to the disadvantages, were the merits of Navajo sheep. They produced the type of wool that was used by Navajo weavers to produce quality blankets. Thus a dichotomy existed. And it was further compounded by the fact that no suitable breed of sheep existed that, if imported to replace the Indian flocks, would at once produce a market product in terms of meat animals and commercial wool while at the same time provide wool-clips from which quality rugs could be woven.

The need for a livestock improvement program was not new nor was it the first time that the problem had been identified. Indian agency personnel had at an early date recognized the need for improving the Navajo breed of sheep. As early as 1883, Merino sheep were imported and loaned to tribal herdsmen for breeding purposes. At the turn of the century Rambouillets were purchased by the Agency for the same purpose.[13] Ram pastures dotted the Reservation. It appears that Navajo could avail themselves of blooded rams at their convenience.[14]

But livestock improvement did not result by importing blooded stock. If anything, the Navajo suffered an economic relapse because other considerations had been ignored. No thought was given, for example, to the fact that there existed not one but several range conditions resulting from different soils, topography, and forage. Uncontrolled breeding practices also became a factor. Rather than herds being improved, therefore, they remained unimproved, or became semi-improved. The normally unimproved sheep, being an in-bred, coarse-wooled, light-shearing, and streamlined animal became, with cross-breeding, a fine-wooled, greasier, and heavier animal. In-breeding thus became a detriment to the Navajo weaving industry. Also the cross-bred sheep, having a mixture of the Navajo breed, remained unsuited for commercial marketing, i.e., it produced wool of uneven quality which was multi-colored and greasy.[15]

In 1917, and again a decade later, Indian agents informed the Commissioner of Indian Affairs that the weaving industry suffered from the results of inbreeding. H. F. Coggeshall called attention to the short, kinky, greasy nature of the wool.[16] A report in 1927 stated that quite a number of women who lived in areas where herders had semi-improved sheep used cotton warp in their blankets because the wool from the "improved" type sheep did not possess the tensile strength to withstand the strain of the warp.[17] Admittedly these conditions did not cause significant concern among the federal hierarchy, since the weaving industry did not compare, economically, with the commercial importance of tribal herds. In fact it took several years before significant concern was expressed over the entire subject of herd improvement.

Formal inquiry into the relationship between the economic needs of the Navajos, range requirements, livestock improvement, and the weaving industry came in 1934. At this time Commissioner Collier became aware of the disparities existing in these relationships and sought help from the Department of Agriculture. In response, Alfred C. True, Chief of the Office of Experiment Stations, directed Bonney Youngblood, an agricultural economist, to acquaint himself with the conditions relative to Navajo livestock improvement and to submit a report.

Youngblood submitted his study in June, 1934. He determined that a research facility should be established on the Reservation for the purpose of conducting basic research in sheep improvements. Tentatively naming the new unit the Desert Indian Range and Sheep Breeding Laboratory, he outlined its needs and justified its existence by stating the objectives that should guide its administration and conduct. Youngblood visualized that the Laboratory's mission must include studies to (1) determine both the type of sheep best adapted to the Navajo range and the economic and social requirements of the tribe, and to (2) determine the

demand for different types of wool, inclusive of the Navajo weaving industry as well as commercial market requirements. Furthermore, training students in the production and management of sheep was necessary as was the administering of programs for range improvement. Also efforts were required to help the Indians earn more money, live better, and improve their environment. Objectively, the economist proposed that the research project could not be expected to return results of a definitive nature in less than 20 years.[18]

Representatives of the Indian Service, the Bureau of Animal Industry, and the Soil Conservation Service reached an agreement, and the Southwestern Range and Sheep Breeding Laboratory was born. On July 1, 1935, the appropriation became available. On November 18, 1935, J. M. Cooper, former Superintendent of the U.S. Sheep Experiment Station at DuBois, Idaho, was named director. And, on December 13, under the authority of the Bankhead-Jones Act, the Secretary of Agriculture approved the cooperative agreement for the operation of the Laboratory. Construction of the plant began on February 10, 1936.[19]

The inception of the Laboratory initiated a multitude of research activities directed toward livestock improvement. Controlled crossbreeding, initiated in 1936, formed the foundation of the program. The scientists first eliminated the Rambouillet from the tests as an unsatisfactory breed. Other blood-lines were then introduced, including the Romney, Corriedale, and Cotswold breeds. With these cross-lines, personnel of

A profitable highly improved flock of sheep (Courtesy, Bureau of Indian Affairs—Department of the Interior).

the Laboratory hoped to produce a hardy Navajo line adaptable to the semi-arid climate, to enhance the herds' ability to produce a good grade of feeder lambs, and to produce a type of wool that could serve both the hand weaving and commercial wool industry.

Livestock management also formed an essential part of the program. Following cross-breeding, selected rams were made available to the Navajo to be used in their livestock improvement programs. In every case mating was controlled and the establishment of ram pastures prevented indiscriminate mingling with uncontrolled herds. The introduction of predetermined mating periods resulted in the reduction in mortality of newborn lambs. As a result of the new controls, the Navajo had larger, healthier, and more marketable herds as well as better products. And, within a dozen years after the project started, the new sheep produced a wool-clip some 58 percent higher than in previous years.[20]

While animal geneticists sought the proper stock to cross with the Navajo breed to increase the size of the meat animal, animal fiber experts conducted parallel investigations to improve the quality of the wool. The quality of Navajo rugs, as measured by their uniformity and smoothness of texture, had declined, particularly after 1920, due to the physical characteristics of the wool of the semi-improved sheep. Due to the research efforts, however, by 1939 not more than five percent of the wool produced on the Reservation was of the poorer Navajo type.[21]

To better define the problem, technologists collected samples of old Navajo rugs from the Museum of Anthropology in Santa Fe, New Mexico.[22] They then conducted studies to determine the characteristics of the wool, including fineness, staple length, sheen shrinking ability, crimp, and weight. From the studies, the ideal wool for purposes of weaving was determined. Comparisons were then made to measure the characteristics of an ideal weaving type wool against the qualities of wool required for the commercial market. Weavers were hired to make rugs utilizing Laboratory sheep wools, and samples of the rugs were then forwarded to Washington, D.C., for purposes of testing their wearability.[23] The weavers also made blankets from Laboratory wools and they, too, were submitted to the Bureau of Human Nutrition and Home Economics for testing.

Initial success in the sheep breeding program between 1933 and 1936 became a marked achievement in terms of research accomplishments. As a total program, however, the Emergency Conservation Work projects and the cooperative efforts between the various Bureaus were less successful. The Navajo people and the federal government did not reap the anticipated rewards in terms of monies and efforts applied to the Navajo Project. Quite simply, due to various factors, the cost-benefit ratio became far too high. Commissioner Collier felt it resulted because various Bureau Chiefs in Washington hindered the operation by attending to small details themselves rather than delegating authority.[24] E. R. Fryer, on the other hand, from his viewpoint as Superintendent of Indian Affairs, felt that other factors impeded the program. Outlining the background of the Navajo Project to participants at a meeting in Flagstaff, Arizona, in 1936, he suggested that problems arose in the first years of operation because technical knowledge at the time was not sufficiently advanced; for example, erosion control could not be extended over such a large area as the reservation. He explained that although progress had been forthcoming in research, there existed a general lack of coordination between specialists in the various Bureaus. Not only did functions between the Departments of Agriculture and Interior overlap but also there was no centralized control; cooperative efforts, therefore, became practically non-existent. As a result, little or no attention was paid to non-stock owning families and, while

one agency introduced stock, another stressed livestock removal. Still the federal agencies were not solely to blame. The political power of large Navajo stock owners caused inequities in livestock reduction. Also the Tribal Council, on some occasions, was indecisive and did not always live up to its agreements.[25]

The untenable circumstances surrounding the program caused a major reorganization to be effected within the Navajo Project. In April 1936, an agreement between the Secretaries of Interior and Agriculture established a Unified Navajo Program whose purpose was ". . . to accomplish the economic rehabilitation of the Indians, to restore their depleted ranges and property [and] to develop their agriculture and other resources. . . ."[26] With new management came a crystallization of efforts and a reaffirmation of commitments.

The Soil Conservation Service, serving an important function in the Land Management Division of the Program, helped accelerate and extend personnel activities. Field personnel divided the Reservation into 18 land management districts; division was made on the basis of topography, existing social and economic conditions, and for the convenience of land management. Specialists such as range surveyors, agronomists, engineers, soil experts, foresters, social and economic survey personnel, and biologists, then conducted district by district surveys. Human dependency survey teams conducted investigations of human resources. Wildlife censuses were taken. Traders and their relationships to the Navajo were studied. Agricultural lands were classified by types and suitability for production. The teams also conducted feasibility studies on roads and communications. In total, in these hogan to hogan surveys, few stones were left unturned.[27]

The Land Management Division surveys formed an important source of information since, for the first time, investigators had facts upon which decisions could be made. Participation by U.S. Department of Agriculture personnel in the Division's activities was not restricted to this area, however, since many ancillary projects were being conducted during this same period. For example, the Soil Conservation Service and the Navajo Agency cooperated in an educational program on the Reservation. Borrowing Department of Agriculture films such as "Save the Soil," "Green Pastures," "Forest or Waste Land," and others agents canvassed the area communicating to as many Indians as possible the consequences of soil erosion.[28] The Farm Security Administration also became active in Navajo affairs. The lands it had acquired adjacent to the Reservation which were administered by the Department of Agriculture were turned over to the Department of Interior for Navajo use.[29] In

Formerly arid and all but useless, this lush pastureland on the Navajo Reservation is located in the Hogback Irrigation Project and is part of the intensive land reclamation program in progress on reservations across the country (Courtesy, Bureau of Indian Affairs —Department of the Interior).

A Navajo woman herds sheep in the off-reservation "Checkerboard" area of New Mexico. The area is made up of several types of government lands intermingled with Indian allotments. Grazing use is administered by the Bureau of Indian Affairs and the Bureau of Land Management. The government lands are set aside for use by the Navajo Indians (Courtesy, Bureau of Indian Affairs—Department of the Interior).

1939 and 1940 the Administration also made loans to the Tribe to see it through periods of drought. In addition, representatives from the Farm Credit Administration advised the Navajo on the orderly conduct and economic marketing of livestock products. The extension services at the various colleges became active in the areas of education and home demonstration.[30]

With the finalization of the district surveys by the Land Management Division and the formation of plans for conducting the management of the various programs, the Soil Conservation Service gradually withdrew from the activities on the Reservation. Beginning in the years 1937-1938, the administration of the Land Management Division became an Indian Service responsibility and Soil Conservation Service personnel remaining in the program transferred to the Bureau of Indian Affairs. The nursery became a unit under the Bureau in 1939 in exchange for certain properties at the Mexican Springs station, the latter falling under the jurisdiction of the Soil Conservation Service. In order to coordinate work on the Reservation, the Division of Roads, Irrigation, and Civilian Conservation Corps of the Bureau of Indian Affairs became responsible to a member of the Engineering Division of the Soil Conservation Service who advised in the formulation of work plans and programs. Soil conservation practices were thereby incorporated into all construction activities on the Reservation.

On April 19, 1940, Reorganization Plan number IV, pre-

pared by President Franklin D. Roosevelt, announced the transfer of all functions of the Soil Conservation Service on public lands to the Department of the Interior.[31] The purpose of the transfer was to reduce duplication in expenditures and work assignments, to increase efficiency, to consolidate agencies according to major purpose, and to reduce the number of agencies involved in the work.

Thus the gestation period of the program for economic rehabilitation for the Navajo nation ended. By the 1940's the Indians gained a certain degree of sophistication regarding their resources and their conservation. They gained exposure to and became aware of, possibly for the first time, the magnitude of the problems confronting them. Off-reservation employment and active participation during World War II enhanced Navajo awareness and made the era of the 1940's a watershed for future improvements. At the same time organized participation by the Department of Agriculture in Navajo affairs declined. Future cooperative efforts would be restricted by the Navajo's ability to qualify for aid under various agricultural programs, their relations with the states which frequently controlled such programs, and with the Bureau of Indian Affairs.

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A young stand of corn representing a first year crop under irrigation in the Navajo Indian Irrigation Project, New Mexico. A pumping plant is in the background (Photo by H. Wittman; courtesy, Bureau of Reclamation, U.S. Department of the Interior).

THE TRIBES' TREES

MONTANA'S FLATHEAD INDIAN RESERVATION AND BIA TIMBER MANAGEMENT

by

Gary Williams*

Nestled beneath the western slopes of the Mission Mountains of Montana is the Flathead Indian Reservation, home to the Confederated Salish and Kootenai Tribes and one of the nation's finest Indian-owned forests. The story of that forest's management is a tale of trials —trials by fire, insects, fluctuating markets, eager contractors, and administrative conflicts. It is the story of the United States Government as trustee for the resources of the Indians of the Flathead Indian Reservation.

The government's trust responsibility began in July of 1855 when Washington Territorial Governor Isaac I. Stevens negotiated the "Hellgate Treaty" with Chief Victor of the Salish Indian Tribe and representatives of other local tribes. That treaty established the boundaries of the Flathead Indian Reservation and delineated the first of many government promises to aid the Indians in developing an agricultural way of life. In addition to a $120,000 payment over a period of 20 years, the government agreed to provide the Indians with an agricultural and industrial school, a blacksmith shop, carpenter shop, flour mill, and sawmill.

The first government operated sawmill on the Flathead Reservation began cutting timber in 1862, six years after a similar mill had been put to work on the reserve by the Jesuits of St. Ignatius Mission. These mills initiated a new view of the forests for the Indians. In areas where Indians previously used little but the edible bark of cedar and pine trees, they now cut large trees for constructing log houses or for hauling to the government mill to be cut into finished lumber. Many cut additional posts to fence their herds of horses and cattle. With such limited domestic use, it must have appeared that the timber resource would last forever. Indeed, the first known logging contract on the Reservation depicts that attitude.

In 1865 the Indian Agent for the Reservation contracted with a former agency sawmill operator to cut 100 MBM* of lumber for the agency. In return for sawing the agency lumber, the contractor was to receive use of the government's mill to saw 100 MBM of lumber for his own use or sale. The contract made no arrangement for the contractor to pay for the logs he was to run through the mill. Instead, it appears that the only value assigned to timber at that time was to the finished lumber product.[1] It would be nearly two decades before some recognition would be given to the true value of the timber resource, recognition that followed the mixed blessing of the advent of the first railroad in the region.

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*MBM is an abbreviation for 1,000 feet, board measure in lumber.

The Northern Pacific Railroad made the first known contract to pay stumpage rates for timber cut on the Flathead Indian Reservation during construction of their line across the southern end of the Reservation in 1882-83. Indian representatives strongly opposed the railroad for fear that it would increase the number of white settlers who were already flocking to the region and making demands for Indian lands. Eventually, they conceded to the government's arrangement with the railroad whereby the Indians received $16,000 for right-of-way lands and $2.00 per thousand feet of cut timber.[2]

Railroad traffic through the region had a two-fold impact on future developments for the timber industry on the Reservation. As the Indians had feared, increased white occupation on nearby lands brought increased pressure to open Indian lands to white settlers, pressure that resulted in the Congressional Act of April 23, 1904, opening the Flathead Reservation under provisions of the homestead, mineral, and town-site laws of the United States. The railroad had speeded a process that was probably inevitable. Though not obvious for years to follow, that same railroad opened new economic opportunity for the Indians who maintained control of the Reservation's immense forests of yellow pine, Douglas fir, and cedar.

An ever-expanding population in Western Montana created a new market for timber products and the Northern Pacific Railroad provided the necessary economical transportation from woodland to mill and market. The forests, whose primary importance to the Indians had been in providing a home to the wild animals that supplemented their diet, suddenly became a marketable resource in the white man's world, a world that was rapidly transforming the Indians' way of life. Because of that new economic importance for the Indian-owned forest, there arose a new need for close supervision of the resource. The Bureau of Indian Affairs (BIA), under the Department of the Interior, accepted the responsibility as trustee for the Indians.

Timber sales from Indian reservations were nothing new in the East and Midwest. J. P. Kinney, long time head of the BIA's Forestry Branch, noted that timber was sold by the Chippewa of Minnesota at Rabbitt Lake in 1861.[3] The Secretary of the Interior and his Commissioner of Indian Affairs heard requests from agents in the field for the Department to assume the power and set policy for sales from Indian forests. It was not until February 16, 1889, however, that Congress finally responded to rising demands for sale of that timber. On that date, it passed an act that allowed the President to authorize Indians under the trust protection of the United States to "fell, cut, remove, sell or otherwise dispose of" dead timber on their lands.

All early sales from the Flathead Indian Reservation forests were conducted under the 1889 law. Primarily, these were sales to traders and in small amounts. With passage of a law in 1904 opening the reservation to whites, Congress included a provision for the appraisal and sale of timber lands. Thus began the first significant timber management problems for the BIA on the Flathead Indian Reservation for, as allotments broke up the larger timber management units, homesteaders illegally filed on timber lands, and mineral prospectors filed on forested areas only to cut the timber and abandon the claims.

Throughout this tumultuous era, from 1904 until the passage of the Indian Reorganization Act in 1934, the BIA sought to protect the interests of the reservation Indians. It brought suit against trespassers, labored at developing a timber management plan amid the burden of numerous reappraisals, and sought to enforce the law with insufficient personnel and funds. Though the complaints were many, the challenge must have had its own rewards. It held Charles D. Faunce as head of the Flathead Reservation forestry program from 1913 until 1945.

By the time Charles Faunce came to the Flathead Reservation from the Southwest, timber cutting on the reserve had reached significant proportions. The first major sales resulted from a severe spring wind storm in 1906 that knocked down large stands of ponderosa pine trees. Although nearly 25 million board feet of timber was cut under those salvage contracts, the sales were more important for the manner in which they were executed. The Department of the Interior's Indian Office relied on personnel from the Department of Agriculture to appraise the fallen timber and make suggestions for the form of contract. President Theodore Roosevelt approved the form of sale, and the Indian Office issued bids. The final contracts were approved by the Secretary of the Interior.

Cooperation between the Forest Service and the Indian Office was an essential part of the Flathead Indian Reservation's forestry program from 1906 until 1909. During that period, the Forest Service gave valuable advice on pricing and sales at first under an informal agreement and then, in 1908, by a formal arrangement. Cooperation ended abruptly in 1909 when Secretary of the Interior Richard A. Ballinger interpreted an Act of Congress of March 3, 1909, as allowing funds for forest management on Indian lands to be paid only to employees of the Interior Department. President William H. Taft agreed to and approved of the regulation changes omitting Forest Service employees from forestry work on Indian lands. The conflict between the Forest Service and the Interior Department was embodied in the strong-willed directors of each with Ballinger as Secretary of the Interior and Gifford Pinchot as Chief of the USDA's Forest Service. After 1910, the BIA strengthened its own forestry program under the able guidance of J. P. Kinney, a former supporter of Gifford Pinchot.[5]

In 1910 the Indian Affairs office established its own Branch of Forestry. It was accompanied by another major legislative act (June 25, 1910, 36STAT673) that for the first time allowed the Secretary of the Interior to approve sales of mature live timber on Indian reservations. No longer were sales on the Flathead Reservation restricted to dead and downed timber. The first step had been laid for increased sales and more efficient management.

Prior to 1911, the Flathead agency reported slightly over 24 million board feet of timber cut by contract from Indian lands. The cutting volume increased steadily from 1911 to 1920, a year in which more than double that 24 million figure was cut. That market held steady until 1930 when the harvest dropped from the previous year's 63 million to approximately 27 million board feet. In 1931 the amount cut totalled only slightly over one million board feet of timber.[6]

Whereas problems in timber management during the two decades after 1910 posed significant challenges in policy-making for measuring harvest, distributing income, and protecting Indian lands from trespass, the new era of Depression shook the whole BIA Flathead forestry program to the roots. The first serious task was readjustment of timber contract prices on existing agreements. Several major contractors were saved from financial distress when the BIA, noting market conditions, refused to assign higher prices provided for by the original contracts. Even that step did not help one large firm that had purchased nearly one million dollars worth of trees between 1917 and 1928.

In 1928 Polleys Lumber Company of Missoula, Montana, signed a contract with the Camas Prairie Unit for over 120 million board feet of timber at values from $3.00 to $4.06 per thousand board feet. With the severe decline in construction, market prices for lumber dropped along with the demand. Polleys built a railroad bridge for access to the unit expending nearly $100,000. Despite several extensions on the contract, by 1935 the company had not yet begun cutting.

The BIA was faced with a dilemma. If the Flathead Agency cancelled the contract and brought suit for damages, it would likely put an end to an operator who had been a vital part of the timber harvesting program for over a decade. If further extensions were granted, the Camas Prairie Unit would lose much value through deterioration. Already, Polleys owed the Tribes $48,000 under the contractual agreement, and the Indians were anxious to collect.

On October 25, 1935, the Assistant Secretary of the Interior declared the contract forfeit and initiated legal proceedings on behalf of the Tribes against Polleys. A district court found in favor of the Tribes for the sum of $83,490. An appeals court upheld the decision, but it reduced the amount by nearly $20,000. Polleys Lumber Company declared bankruptcy and went out of business, leaving the Indians with $37,000 in advance deposits and $38,000 from the bonding agent for the sale.[7] It was a temporary gain and, potentially, a long-term loss to the reservation's forestry program. The BIA decided that the contract arrangement also was a poor one as it was dangerous to set a precedent of too many exceptions, even in light of the depressed economy.

Some results of the Depression were advantageous to the developing forest management practices on the Flathead Reservation. The Civilian Conservation Corps was one such example. It constructed, primarily with Indian labor, roads into previously inaccessible forest areas. Protection from fires was increased along with added marketability for the timber. Other projects included construction of lookout towers, trails, and phone lines; stand improvement, and insect control.[8]

In addition to the physical improvements by the Civilian Conservation Corps, the Depression era produced a conceptual change in the BIA's forest management plan that was to have a far-ranging impact. In 1934, Congress passed the Indian Reorganization Act which mandated sustained-yield forestry planning on Indian lands under BIA management. Though not immediately implemented, the idea of sustained yield became the basis for planned management on the Flathead Indian Reservation. Under the 1934 directive, forestry personnel were to conduct an inventory of the forest

resource, create a plan for managing it, and cooperate with the United States Forest Service in forestry matters.

The lack of cutting during the Depression and personnel shortages caused by the war years delayed enactment of a "management plan" for the Flathead Reservation until 1945. Though far from answering all of the needs of the Flathead Reservation's forest administration, authors of the 1945 *Timber Management Plan* recognized that cutting the forests at the same rate as occurred from 1911 to 1944 would terminate the forest's productive capacity by 1962. It was recommended in the *Plan*, therefore, that the average annual cut be reduced from 24 MMBM to 10 MMBM since it was believed that the reduction would allow the forest to reproduce at a sustained rate.[9]

Ponderosa pine forest on Flathead Reservation near Hot Springs, Montana. Cut over area is a residual stand cut during the period from 1943 to 1945 (Photo by Don Morrow; courtesy, Bureau of Indian Affairs—Department of the Interior).

A basic failing of this plan was its reliance upon a 1936 Forest Service "check cruise" for information as to the volume of commercial timber on the reservation. Laboring over the 1945 *Plan*'s mandate for a reduction in timber sales, the BIA Forestry staff on the Flathead soon found inaccuracies in that 1936 estimate. The foresters had to withstand the pressures from contractors and the Tribes during the post World War II years as the demand for timber soared. Finally, in 1962, with Tribal support and funding from the federally-sponsored Area Redevelopment Administration, the BIA contracted with a private firm to produce a new inventory of the reservation's forests. Completed the same year, the inventory revealed that the volume of commercial timber on the reserve was nearly double that of the original estimate.[10]

Armed with more accurate inventory data, the BIA Branch of Forestry constructed a new timber management plan in 1962 which called for a gradual increase in cutting. It also set the foundation for "intensive forest management" as well as a planned program for harvest, reforestation, and protection from fire, insects, and disease. Intensive forest management was a program to provide maximum profits for the Tribes while insuring continued productivity. Forestry work in the 1960's and 1970's under that plan required a greater expenditure of labor and money. Much of the success of the program during those years was based on increased Tribal participation. Tribal interest in forest management grew rapidly in the late 1960's while Tribal contributions to the program increased from eight percent of the budget in 1967 to nearly 26 percent in 1970. That Indian money was used to employ added personnel in the BIA's Branch of Forestry at the reservation and to improve stands and control fires.[11]

The most recent timber management plan for the Flathead Indian Reservation continues the effort in intensive management. *Flathead Indian Reservation: Forest Management Plan, 1972-1981* is the most comprehensive forestry analysis ever undertaken on that reservation. It contains four documents: 1) *Forest Management Plan*, 2) *Environmental Impact Assessment*, 3) *Logging History*, and 4) *Forest Inventory*. Through a study of past practices and current resources, it shows the BIA Branch of Forestry's commitment to quality management of the Indian forests.

That BIA commitment over the years has placed the agency in innumerable difficult positions as trustee for the Indian owners of the reservation resources. It has had to protect the forests against illegal incursions by white homesteaders and miners. It has had to manage large logging units while keeping separate records for small allotment tracts within the same boundaries. It has had to hold back tribal and white enthusiasm for some sales that might endanger the sustained-yield effort. Through all of these trials, the BIA kept the vision of its trust responsibility and of the long-term benefits to the Tribes of responsible forest management.

The Tribes probably will control and operate their own forest management program. Steps were taken toward greater tribal control under the 1934 Indian Reorganization Act and the Tribes showed increased interest in the forest resource after successfully defeating attempts at "termination" of BIA management in the 1950's. As mentioned above, the Tribes have significantly increased their role in forest management in recent years through greater financial commitments. The BIA, however, still continues in the leading role for timber management.

From 1970 to 1974, contractors cut 292,366 MBM of timber from the forests of the Flathead Indian Reservation, and paid $15,754,194 for the privilege of doing so. The forest products industry during those years accounted for 61 percent of Indian income on the reservation. The forestry program came a long way from edible barks and no stumpage fees in 1865 to today's commercial cutting and forest management.

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Rainbow or Dog Lake on the Flathead Reservation in Montana is the location of the Indian owned and operated Dupuis Bros. Sawmill (Photo by Don Morrow; courtesy, Bureau of Indian Affairs—Department of the Interior).

CHANGES IN AGRICULTURAL TECHNOLOGY ON INDIAN RESERVATIONS

by

Carl W. Deitemeyer and Stuart Jamieson*

The Indian and the white man have exchanged agricultural technology since the days of the Mayflower colonists. It was the Indian Squanto who first showed the colonists the value of fish as fertilizer as well as how to girdle trees in order to allow more sunshine to reach the soil. The white man adopted the Indian hoe-hill practices because of scarcity of labor and need for food. During the following decades, with the population doubling every 20 years, the horse-mule agriculture fostered the need for sound soil and moisture conservation practices. Today, soil and moisture conservation districts virtually blanket all of the nation's agricultural lands. Many Indian reservations are also practicing soil and moisture conservation with the help of the Soil Conservation Service.

Indian reservations range in size from mini-settlements in California of only a few acres to the Navajo Reservation in Arizona, New Mexico, and Utah of about 14 million acres. There are only ten other reservations with more than a million acres—four in Arizona, two each in Washington and South Dakota, and one each in Wyoming and Montana. While there are more than 900,000 Indians in the United States, the Bureau of Indian Affairs estimates that fewer than 500,000 Indians live on reservations. The following statistics reveal the ten states in which Indians comprise one percent or more of the population: Alaska has 17.05 percent; New Mexico 7.16 percent; Arizona 5.40 percent; South Dakota 4.86 percent; Montana 3.91 percent; Oklahoma 3.82 percent; North Dakota 2.33 percent; Nevada 1.62 percent; Wyoming 1.50 percent, and Utah 1.06 percent.

Much of the Indian reservation lands are considered to be marginal and sub-marginal as far as agricultural production is concerned, with a definite need for supplemental irrigation. There is, however, a dearth of water in many reservation areas. The best examples of highly developed agricultural technology can be found on the Navajo Reservation. Currently, an irrigation development project has been started which involves 110,630 acres of desert land near Shiprock, New Mexico.

Navajo farms in San Juan River Valley between Shiprock and Farmington, New Mexico (Photo by Don Morrow; courtesy, Bureau of Indian Affairs—Department of the Interior).

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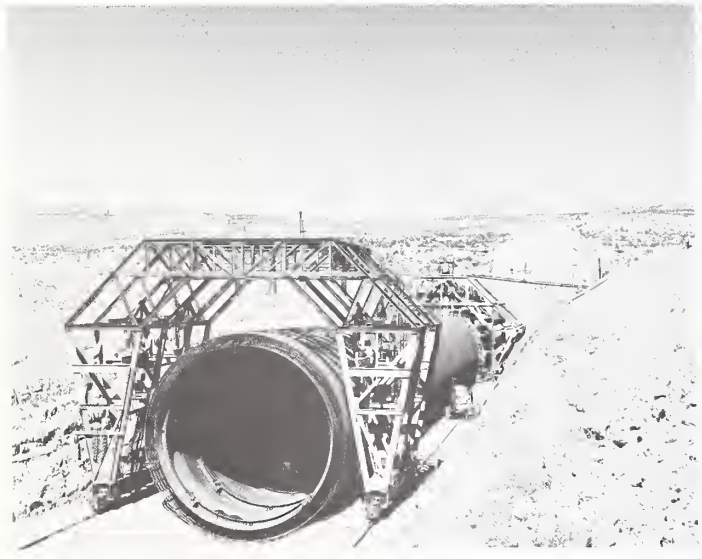
It is a ten-year program having as its goal the placing into production of 10,000 acres each year. Funding has come primarily from the Navajo Tribe, the Bureau of Indian Affairs, and the Four Corners Regional Commission. As one of the most sophisticated systems in the world, water from the Navajo Dam flows through canals, conduits, and pumping stations to the dryland from a controlled sprinkler irrigation program.

Canal at the Navajo Indian Irrigation Project, New Mexico, as the first water is being released down the Gravity Main Canal, 1977 (Photo by H. Wittman; courtesy, Bureau of Reclamation, U.S. Department of the Interior).



Large siphon facing upstream—part of the extensive Navajo Irrigation Project (Courtesy, Bureau of Indian Affairs—Department of the Interior).

Alfalfa, grain, and silage crops are grown, the bulk of which is used in tribal livestock operations. This irrigation project is managed through a special agricultural board whose authority is derived from the tribal council. The original board, which was composed of outstanding national agri-business leaders and specialists, brought in the best talent available to supervise the transition from arid desert land to lush green fields. While the project has already provided dozens of jobs for Navajo Reservation residents, as more land is brought into production, many more jobs will be created. The project plan calls for cooperative farming in the Fourth Block of 10,000 acres. Families will be encouraged to lease land from the Tribe, use machinery and equipment cooperatively, and market and purchase supplies. There is a definite need for effective training programs at all stages of a development of this kind. When the Navajo project is completed, it has been estimated that some 6,550 families will have jobs as farm operators, custom laborers, and employees in related service activities. This project should bring a higher standard of living to more than 33,000 Navajo Indians.

The Colorado River Reservation in Yuma County, Arizona, and in San Bernardino and Riverside Counties, California, contains some of the finest irrigated land found anywhere. At one time, the tribal council had arranged for long-term leases with commercial farming companies to develop Reservation lands and thousands of acres were prepared for irrigation. Crops produced today include various vegetables and melons, a large tonnage

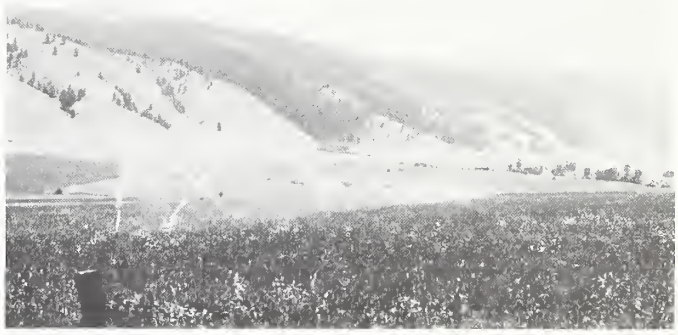
This thriving bean field is located on California's Colusa (Cache Dehe) Rancheria and is worked by all members of the Band for the benefit of the community (Courtesy, Bureau of Indian Affairs—Department of the Interior).

of which is flown to eastern markets by night air freight. Reservation leaders plan to develop other acres following the practices that have been demonstrated as successful for intensive agricultural production. The Mojave and Chemehuevi Indians who live on the Reservation have inhabited the Lower Colorado River lands since recorded history. This reservation was created as an inducement to these Indians to abandon their warlike attitudes and adopt agricultural practices. For centuries these tribes raised corn, melons, native beans, roots, and mesquite beans on the rich bottomlands of the Colorado River. Irrigation on the Colorado River Reservation is one of the largest and potentially most productive of all the Indian water projects. Funds requested to develop this sytem amount to $3,887,500 which includes $525,000 for power system construction and rehabilitation. The irrigation is a necessary feature in the total development of the Reservation.

The first Indian reservation irrigation projects, which were started between 1906 and 1908 in Montana, included the Blackfeet, Crow, Flathead, Fort Belknap, and Fort Peck. In Nevada there is irrigation development on the Duckwater, the Goshute, and the Southfork Reservations;

An irrigation pumping plant helps to supply the Pablo reservoir at the Flathead Reservation, Montana (Photo by Don Morrow; courtesy, Central Library, Department of the Interior).

a portion of the Southfork has been irrigated for more than 100 years. Many existing structures have deteriorated to the point where only about one-half of the original acreage can be irrigated. Recent studies and observations indicate that water losses due to deterioration and inadequate distribution systems range from 30 to 75 percent. The Northern Pueblos of New Mexico, which consist of four tribes, were irrigating lands at the time of their first contact with the Spaniards in 1540. The irrigation canals were constructed at random while the diversion dams were small makeshift structures that were in need of constant repair. Today major repairs, project rehabilitation, concrete canal lining, and the cleaning of main canals are performed by the Bureau of Indian Affairs. The Southern Pueblos of New Mexico, which consists of six small tribes, all benefit from irrigation in their subsistence type of agriculture.



A farm on the Flathead Reservation which has a modern sprinkler system to improve water distribution to the crops (Courtesy, Bureau of Indian Affairs—Department of the Interior).

On many Indian reservations irrigated farming is the basic economic industry and, often, it is the only industry available to Indians. Because of the acute

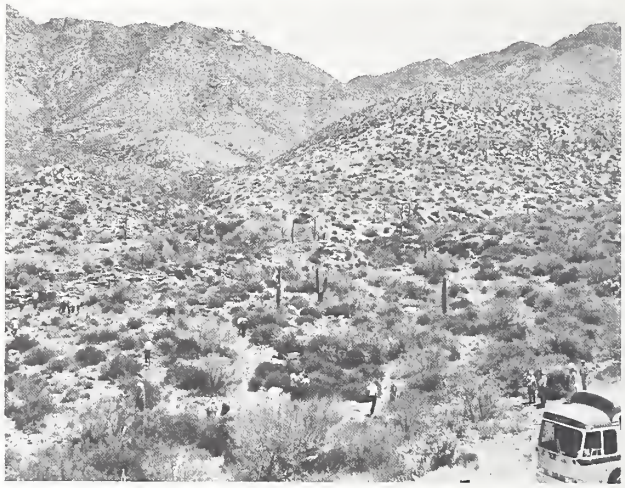
An irrigation machine at work on Blackfeet Indian lands in Montana. The machine draws water from the canal and "rains" over a wide area of surrounding cropland (Courtesy, Bureau of Indian Affairs—Department of the Interior).

competition for water on and adjacent to reservations, particularly in the West, there is greater danger of water loss to the Indians if this resource is not put to beneficial use. At Fort Yuma, Arizona, the Quechan Tribe has developed a sophisticated controlled environmental farm—formerly known as greenhouses. On five acres the tribe is producing two tomato crops a year for a total of 1.3 million pounds. While each plant produces 15 to 16 pounds, the crop itself is very uniform, has an outstanding skin texture and color, and commands the highest market price. The special nursery for seedlings which is owned by the Quechan Tribe has the following facilities: cooling, sorting, packing equipment, and a special water purification system. When the project is finished the tribe will have nine acres of controlled environmental production. The initial cost of the facility was $1,250,000 with federal grant funds supplying the financing. The tribe is expected to make a substantial contribution towards the cost of this operation. Of primary concern to the tribe is the additional jobs created rather than mere profit. For example, at the onset 23 permanent positions were provided, with 20 additional during peak seasons.

The Alaskan Natives Association is involved in a specially controlled environmental agriculture research and demonstration unit in that northern climate. It differs from the Fort Yuma project in that certain factors such as temperatures, humidity, carbon dioxide, nutrients, and light are controlled. While needed light is furnished by electricity through high intensity discharge vapor lights, balanced plant food is fed through a nutrient system that is essentially a modified hydroponic system. As preferred vegetables on the Alaskan market, tomatoes, cucumbers, lettuce, and radishes are produced. Because growing head lettuce is a real problem, the University of Alaska horticulturists are attempting to develop a more marketable product through genetic engineering. While tomatoes are produced every 60 days in a continuous year around cycle, ordinary leaf lettuce can be produced in 29 days.

The Alaskan Indians also supplement their income from fishing and canning enterprises. Here they are seen bringing up a net full of brailing, a popular commercial fish on the south eastern coast (Courtesy, Bureau of Indian Affairs—Department of the Interior).

Two desert plants that have shown good potential for economic development on Indian reservations are Jojoba (Ho-ho-ba) and Guayule (Why-oo-lay). Both plants could be raised on most of the 26 Indian reservations in Arizona and California and several reservations in the Sonoran Desert are already working on them experimentally. The Jojoba, an evergreen shrub, grows wild over a wide area in the Sonoran Desert, including the arid areas of Southern Arizona and Southern California. The



A hillside of wild Jojoba shrubs growing on the San Carlos Apache Reservation, Arizona (Courtesy, Bureau of Indian Affairs—Department of the Interior).

female plants produce berries that contain about 52 percent liquid wax which is difficult to synthesize commercially. The only other natural source of this wax is the sperm whale, a species which is now on the endangered list. After much research and testing was done by the University of Arizona, the University of California, Riverside, and the U.S. Department of Agriculture, experimental plantings were made on a number of desert Indian reservations. Included among these are the San Carlos Apache and the Papago in Arizona and several smaller ones in Southern California. A

Indians on reservation land in southern California pruning a wild stand of Jojoba (Courtesy, Bureau of Indian Affairs—Department of the Interior).

panel of the National Academy of Sciences has reviewed all of the research and has voiced strong support of the crop's potential. Only limited irrigation during the first year after planting Jojoba is needed and very little or none thereafter. The fact that Jojoba also does well in saline and alkaline soils and saline irrigation water is an important factor since many agricultural crops have proven to be intolerant of these conditions.

There are two bills before Congress that would provide funds for implementing the Bureau of Indian Affairs' master plan for Jojoba. This plan calls for 200 acres of Jojoba to be planted on each of five reservations during the first year. Plantings would be increased until 10,000 acres were in cultivation on at least 10 reservations at the end of five years. The plan also calls for spending $700,000 to $900,000 each year on Jojoba in the following areas: research; development; technical and management assistance; capital equipment, and fellowships for Indians to study specialized agriculture.

Five years after Jojoba is planted and without any genetic improvement, each acre should produce about 1,760 pounds. Experimental plantings have produced five times this amount. Ten years after planting, the 10,000 acres should be producing 1,980,000 pounds and would sell for an estimated 40 cents per pound. Even if Congress fails to provide funds, there is momentum gathering in the private sector. For instance, California farmers have planted about 1,000 acres while large agri-business corporations have begun experimenting with the Jojoba.

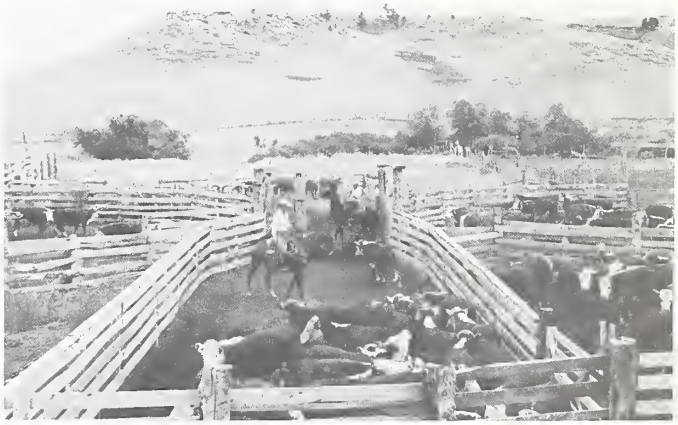
Tribal leaders also have taken an interest in Guayule, which is native to southwestern Texas and northern Mexico and could easily be cultivated on marginal Indian lands. This desert shrub, from time to time, has yielded commercial quantities of raw natural rubber. Since petroleum is the prime ingredient cost of synthetic rubber, as oil prices increase so will the price of synthetic rubber. Once again, therefore, Guayule may become economically feasible. In addition, a Guayule industry could offer an environmentally clean and energy conserving alternative.

The United States needs natural rubber for its industry because, with its elasticity, resilience, adhesion, and resistance to heat, it is far superior to synthetics. For example, automobile tires contain about 20 percent natural rubber. Radial tires, which now dominate the market in the United States, contain as much as 40 percent natural rubber. Aircraft, tractor, and earth-moving equipment tires are comprised of 100 percent natural rubber. Today, the United States imports more than $500 million worth of rubber annually. According to a National Academy of Sciences Panel, Guayule rubber could serve all of these uses for its physical and chemical properties are virtually the same as those of hevea (Pará) tree rubber.

The United States has few wild stands of Guayule. This points to a real need for both its cultivation and the breeding of Guayule strains that contain both quality and high quantities of rubber. As research on various aspects of Guayule continues, the United States Department of Agriculture's Research Service in Pasadena, California, has found that the rubber yield can be doubled by chemically spraying the shrubs. The National Academy of Science has recommended that the government centralize all its records on Guayule research in a Southwestern area university.

The Indian tribes have begun to assume greater responsibility for determining the needs of their tribes. Some local tribes with the help of the Bureau of Indian Affairs which supplies most of the funds and technical assistance, have contracted with Land Grant Colleges' Extension Services to provide them with special agricultural agents. These agents work with Indian farmers on an intensive basis in the general areas of crops, livestock, and irrigation practices in an effort to improve agricultural income on small family tracts. In another instance, the Indian Cattlemen's Association has asked the Bureau of Indian Affairs to set up a national training program the purpose of which is to upgrade the quality and management of beef cattle on all Indian reservations. In the case of the Seminoles in Florida, however, this was unnecessary since their livestock leaders have had a cooperative improved sire program for 25 years.

Steve Howlett, member of the Flathead Tribe, at work on excavation for irrigation structure (Courtesy, Bureau of Indian Affairs—Department of the Interior).



Working a herd of cattle at Morningstar Ranch in Montana. This is a tribal enterprise of the Northern Cheyenne (Courtesy, Bureau of Indian Affairs—Department of the Interior).

There are other illustrations of this tribal self-determination such as on those reservations in the Pacific Northwest which gross a sizable income in the selling and managing of timber—the Colville Reservation in Nespelem and the Yakima Reservation in Toppenish, Washington, are but two of the larger examples. In addition, several of the smaller tribes on the Olympic Peninsula are beginning to use modern technology in aqua-culture in rearing salmon and oysters for specialized markets.

A skate from the Swinomish tribal fishtrap Tulalip Indian Agency, Washington, 1938 (Photo by Andrew T. Kelley; courtesy, Bureau of Indian Affairs—Department of the Interior).

To keep up with modern agricultural technology, the Indian tribal leaders and the Bureau of Indian Affairs have included the following elements in their agricultural program for 1978:

1) assisting in the planning of programs and projects for conservation and use of farm, ranch, watershed, and other reservation lands;

2) assisting in the application or installation of measures for soil, water, and range conservation;

3) completing inventories of soil, range, and water resources.

The challenge remains to further promote modern technology on Indian lands and to encourage the tribes in their desire to help themselves.

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The selection of good bulls is essential to maintain herd quality (Courtesy, Bureau of Indian Affairs—Department of the Interior).

AGRICULTURE AND AMERICAN INDIANS: RESEARCH AND SOURCES

by

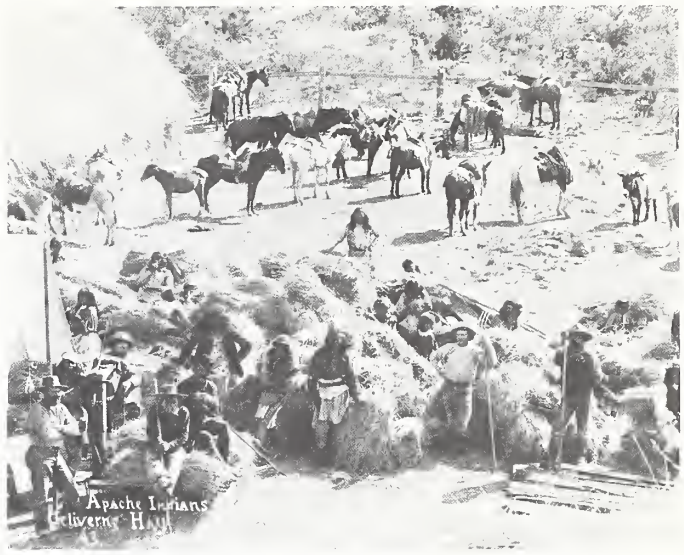
Thomas R. Wessel*

Conventional wisdom has long defined American Indians as predominately hunting people engaged in either war among themselves and whites or as fearless chasers of buffalo across the prairies. Such a restricted view undoubtedly reinforces a tendency to seek out and explore the lives of great leaders. Consequently, while generally abandoned as the principal method to gain meaning from the past, the "great man" approach to Indian history persists. Attention is drawn to the mercurial figures of Chief Joseph, Sitting Bull, Crazy Horse, Geronimo, Sequoia, and other political and war leaders. Without denying the importance of Techumseh and Osceola or the skills of the buffalo hunters, it is safe to assert that we can learn no more of Indian history from the study of great men alone than we can understand the American experience by studying only the lives of Washington and Lincoln. It is time for Indian history to move on.

The history of any nation is the story of important but unprominent people. Further, even the great men of history were not totally detached from the experience of those whose names are lost. The ordinary activity of daily life when viewed as individual effort may appear mundane and unmoving, but when taken in the aggregate can have profound consequence. So it is with the history of Indian agriculture. Surely, nothing was more basic to the lives of the American Indians than the process by which they sustained life itself. Even the most casual inquiry soon indicates that for many of the American Indians agriculture provided not only food, but it was also a prime economic activity leading to contact with other Indians and newly arrived Europeans.

Arapaho camp with buffalo meat drying near Fort Dodge, Kansas, 1870 (Photo by William S. Soule; courtesy, National Archives).

It has long been noted that the hunting culture of the Plains Indians conditioned their reaction to invasion by other tribes and the white frontier. Surely, the



Apaches delivering hay at Fort Apache, Arizona (Photo by C. A. Merkey; courtesy of the National Archives).

agricultural base of many of the American Indians played no less a role in conditioning their response to similar invasions. Historians recognize that the study of agriculture has both a social and a political content. In the study of 19th century white experience this recognition is almost axiomatic. Why not suppose then that Indian agriculture influenced political and social attitudes as intently as in white society?

Indian agriculture need not be confined to the study of techniques and crops, although that is worthy in itself. The role that agricultural production played in establishing the norms of social structure among the Indian tribes is significant. The highly organized social and political union of the Iroquois Confederation relied at least in part on a predictable food supply. Solving the problem of subsistence enabled the Iroquois to release their energies in a host of activities. To the South, the Creek Confederation, formed on much looser lines, was similarly based on sustained agricultural production. Agriculture clearly was a source of useable wealth among the tribes and allowed some to expand their range of activities and influence beyond their immediate borders and beyond the influence their numbers would have otherwise indicated. That observation is no more evident than in the Indians' role in the fur trade. Generally Indians have been described as the hunters of furs and their influence confined to that basic activity. Yet, agricultural products were an important ingredient in sustaining the fur trade. The source of agricultural products moving through the fur trade seems to be principally Indian farmers. Studies touching on this aspect of the fur trade are slight. Additional surveys of the structure of the fur trade with an eye toward the role of Indian agriculture are clearly needed. Such an inquiry will also help explain

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the shifting relationships among Indian tribes and relations between Indians and whites engaged in the trade.

The adoption and adaptation of Indian agricultural methods and crops by early settlers is in need of further investigation. The manner by which information passed from Indian agriculturalists to white settlers seems to stop with Squanto as a subject for investigative inquiry. The rapid advance of the agricultural frontier in New England was conditioned in part by the existence of successful Indian farmers in the region. Early trade between white settlements and the Indians apparently consisted of agricultural products to a considerable degree. With the size of the populations involved and the land mass available conflict between Indians and whites in the region might better be understood as the rivalry between competing agricultural societies. A study of the system of transfer of Indian farming methods to white society might also provide insights into the persistent characterization of the Indians as hunters even in the face of overwhelming personal observations to the contrary. The universal picture of the savage hunter may have been a social imperative. Social values based on an agrarian ideal might prove difficult to sustain when shared by a competing race that was clearly different.

Paiute woman grinding seeds in doorway of thatched hut, 1872 (Photo by John K. Hillers; courtesy, National Archives).

A study of Indian farming techniques and crops might also provide some clues to western settlement patterns. The relative ease of movement through river valleys undoubtedly explains settlement patterns. But the fact that early settlers across the mountain barrier carried agricultural techniques acquired from eastern Indians might also afford an explanation. That these techniques persisted among the early farmers of the Ohio Valley seems evident. A clear picture of Indian woodlands farming and the process of transferring those techniques to white settlers could provide another dimension to our understanding of the early western movement.

Indian land use patterns have been generally neglected. Settled agricultural life among the tribes of the southeast and southwest often conflicted with nomadic hunting cultures as well as invading whites. The

Two Seminole women cooking cane syrup, Seminole Indian Agency, Florida, 1941 (Photo by Gardin; courtesy, National Archives).

Pumpkins growing in front of a single-family Zuni adobe, about 1879 (Photo by John K. Hillers; courtesy, National Archives).

tense but continuous relationship established between the Pueblos of the southwest and the buffalo hunters sustained itself on Pueblo agriculture. The erroneous tales of cities of gold and silver that brought Spanish adventurers to the southwest had an agricultural origin. Nomadic tribesmen related such stories reflecting their own measure of wealth, the stores of foodstuffs they observed in the agricultural villages.

A Seminole spearing a garfish from a dugout, Florida, about 1930 (Courtesy, National Archives).

The use of the land may be a neglected aspect of Techumseh's effort to build alliances among the tribes of the Ohio Valley. Generally treated as a political movement alone, investigators have failed to explore the economic and social character of Techumseh's appeal. Along with the Prophet, the Shawnee leader called for a return to an earlier and unpolluted life of the past. Whites often justified taking Indian land because of the supposed hunter's inefficient use of the resource. If Techumseh had been successful, however, the reestablishment of settled agricultural villages would have posed a more difficult barrier to white encroachment.

Competition for land was at the heart of conflict between Indians and whites in the southeast. The well established agriculture of the Five Civilized Tribes (Cherokee, Choctaw, Chickasaw, Creek, Seminole) provided a means for extended resistance to white intrusion. Only after the full force of the federal government was brought to bear on the Five Civilized Tribes did their removal west of the Mississippi become inevitable. The communal agriculture of the Five Civilized Tribes apparently did not survive in the Indian Territory. Indian agriculture as practiced in the Indian Territory took on a highly individual character. In what way the change in agricultural patterns and land use among the Civilized Tribes affected their social structure and political system remains uncertain. The experience of the Five Civilized Tribes during the federal government's assault on Indian tribalism in the early 20th century might be best understood through an investigation of agricultural patterns and habits.

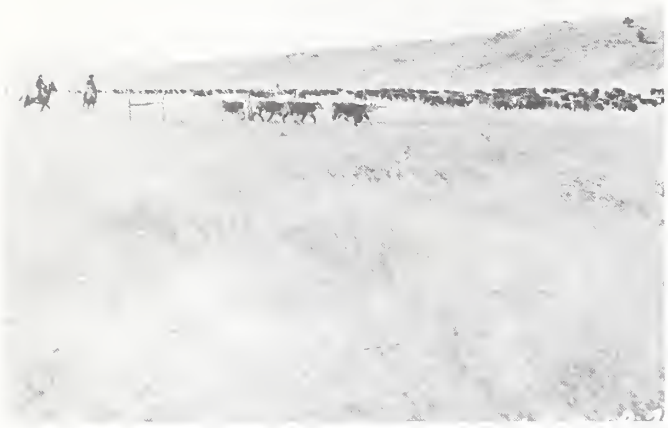
The Plains Indians dominate the historical literature on American Indian life. The image of horse mounted warriors at war or on the hunt creates an appealing drama. That the Plains abounded in settled agricultural Indians in the river valleys tends to be overlooked. Yet, the existence of strategically placed agricultural people along the Missouri, Republican, Wichita, and Canadian rivers living in sometimes hostile, sometimes symbiotic relationships with the hunting tribes undoubtedly conditioned the life style and attitudes of both. The settled tribes, because of ease of encounter and control of valuable river land, suffered first from white intrusion. Their experience probably led to as much disruption of the nomadic Indians' life as the encounter of whites with the buffalo hunters.

Students branding cattle at Seger Colony School, Oklahoma, about 1900 (Courtesy, National Archives).

The reservation period dating from the mid-19th century to the present is a fertile field of investigation for agricultural researchers. The principal activity of the reservations following earlier precedents was grounded on the assumption that the Indians would become like white farmers. A study of Indian agriculture on the reservations is also a study of assimilation. Agriculture became the basis for federal government's only official assimilation policy. Ironically, most of the effort came after a time when agriculture dominated the American economy. It remains uncertain if the government viewed agriculture on the reservations as a means of bringing the Indians into the main stream of American society or as simply creating isolated agricultural subsistence villages. A study of the policy could show how a dependent people adjust to imposed conditions and it could reveal how white Americans view subject people and themselves.

Casual investigations of agriculture on the reservations suggest that the reservations often became a type of experiment station not only in social engineering but also in agricultural techniques. Ranch farming that came to dominate the cattle industry of the west seems first to appear in a substantial way on the northern Plains reservations. Whether that process was deliberate or fortuitous is yet unclear. Much of the early work of the Bureau of Reclamation took place on Indian reservations. Early irrigation projects tended to fail. On Indian reservations the cause of failure is usually attributed to the lack of Indian interest and

use of the systems. Whether such an assertion is valid awaits investigation. Surely it is questionable for the southwest where irrigation at a sophisticated level predates the arrival of whites.



A co-op cattle drive on the Cheyenne River Reservation near Aberdeen, South Dakota (Courtesy, Bureau of Indian Affairs—Department of the Interior).

The Bureau of Indian Affairs established an equivalent of the Cooperative Extension Service for Indian reservations in 1928. Little is known of its work. The geographic distribution of the reservations and the cultural diversity of the Indians provided an unusual opportunity to test the application of extension techniques. A study of the Bureau of Indian Affairs' Extension Service could provide information on how farming techniques are introduced in underdeveloped areas. This type of study could be of particular value when focusing on the Indian reservations. The reservations were self-contained and inhabited by people with an acute suspicion of federal agents. Some experienced Indian farmers were encumbered by ingrained prejudices toward new farming methods. On other reservations the problem was often more fundamental; it amounted to convincing the residents to farm at all.

A unique experiment on the Blackfeet Reservation probably led to the creation of an Extension Service in the Bureau of Indian Affairs. In the 1920's Fred Campbell, the reservation superintendent, began what he called a Five Year Industrial program. The program was designed to get most of the Blackfeet to take up subsistence farming. Campbell's program seems to have been directed toward making each Blackfoot family independent of government food rations. His program sufficiently impressed his superiors in the Bureau of Indian Affairs that the Five Year program became the basis for reservation economic development throughout the northern Plains and the northwest. No complete study of the program on the Blackfeet Reservation exists and its extension to other reservations has received little attention.

Tallying a herd of sheep on the Blackfeet Reservation in Montana (Courtesy, Bureau of Indian Affairs—Department of the Interior).

Agriculture played a fundamental role in the programs initiated under the Indian Reorganization Act of 1934. Recent studies of the Navajo experience in the 1930's suggests the need for additional investigations of reservation life during the New Deal and after. Agriculture continues to be the major source of income for most reservation Indians. An understanding of contemporary reservations particularly in the west in regard to water rights will require studies of current reservation agricultural programs.

Researchers have just begun in the field of Indian agriculture. It is not, however, completely devoid of scholarly study. The field has been a preserve of anthropologists. Consequently, researchers educating themselves about Indian agriculture are obliged to gain a working command of the anthropological literature as well as the traditional sources of history. The anthropologist's method is alien to that of many researchers. The concept of time that binds historical study is often absent in anthropology. Observations and oral traditions frequently are bound by space without consideration for change over time. Anthropologists have delineated cultural areas that may appear static to researchers. Although their contributions to the accumulation of knowledge are profound, researchers trained in the rigid use of documentary evidence may find anthropological methods and sources uncomfortable. Nevertheless, within the anthropological literature, researchers will find a wealth of information on Indian agriculture.

In the study of any people lacking a literary heritage the historian's basic problem begins with the nature of the sources available. Virtually all of the sources are secondary accounts written by observers, not by participants. The written accounts of explorers, missionaries, casual travellers, and the records of government

officials constitute the bulk of historical materials. There are few written Indian sources. Without a critical eye for the self-serving report the researcher is in danger of perpetuating the bias of the observer. This is not a new problem for researchers but in Indian history an awareness of the problem is vital.

There are several excellent bibliographies to aid the researcher in Indian agricultural history. George Murdock's *Ethnological Bibliography of the North American Indians* (1960) is a must on the shelf of any serious student. Dwight Smith, *Indians of the United States and Canada: A Bibliography* (1973) contains abstracts of over 1,700 scholarly articles many of which touch on Indian agriculture. Frederick Dockstader's *The American Indian in Graduate Studies: A Bibliography of Theses and Dissertations* now in two volumes (1957 and 1974) covers graduate work between 1890 and 1970 and lists a generally untapped source of references to Indian agricultural history. Guides to state archives, library holdings, and manuscript collections abound. A convenient digest of the most useful guides along with listings of some 9,000 books and articles on all aspects of Indian life can be found in Paul Prucha, *A Bibliography of the History of Indian-White Relations in the United States* (1977). Still useful is Edward Everett and Wayne Rasmussen, *A Bibliography of the Agriculture of the American Indians* (1942). John T. Schlebecker's *Bibliography of Books and Pamphlets on the History of Agriculture in the United States, 1607-1967* (1969) should not be overlooked.

The sources of early Indian agriculture will be familiar to most researchers. Still the best source on American Indians in the 17th century is Reuben Gold Thwaites, *The Jesuit Relations and Allied Documents* (73 volumes, 1896-1901) and for the 18th century his *Early Western Travels*, 1748-1846 (32 volumes, 1904-1907). The Jesuits were acute observers and the careful researcher will find considerable reference to Indian agriculture in their reports and letters. A major source of early Indian agriculture can be found in the military reports from French and English commanders on the Frontier. Military leaders while tending to exaggerate their accomplishments quickly realized that a people unable to feed themselves were soon subdued. Such reports are found in the *Jesuit Relations* and in colonial collections such as E. B. O'Callaghan, ed., *The Documentary History of the State of New York* (1850) and the Sparks collection at Harvard University. Many French sources remain untranslated. Recently, Joseph Lafitau's *Moeur des Sauvages Ameriquains* (1724) has become available in English. Other useful early accounts such as Gabriel Sagard-Theodat, *Le Grand Voyages du pays des Hurons situé en l'Amerique la Mer douce . . .* is available only in French. Only fragments of the Dutch records from Fort Orange survive. A search of archives in the Netherlands might bring more material to light. A store of material on the early experience is contained in the archives and publications of the *Proceedings and Transactions* of the Royal Society of Canada.

Most of the sources regarding Indian agriculture are found in the public record. House and Senate documents, committee hearings, Indian agent reports, treaties and material related to treaty negotiations contain a wealth of information. A number of indexes guide the researcher to these sources. A list of indexes to most government publications is found in Prucha, *A Bibliographical Guide to the History of Indian-White Relations.* The numerous debates in Congress on Indian bills often provide information on Indian agriculture. Indian treaties frequently make references to Indian agriculture. A compilation of Indian Treaties and laws can be found in Charles J. Kappler, *Indian Affairs: Laws and Treaties* (5 volumes, 1904-1941). The reports of the Commissioner of Indian Affairs are an invaluable source of information. Most Commissioner's reports contained annual reports from field agents and were accompanied by a yearly statistical summary. For the early years of the Republic consult the *Annual Reports* of the Secretary of War. After 1849 the Commissioner of Indian Affairs report is part of the *Annual Report* of the Secretary of the Interior. The nature of the Commissioner of Indian Affairs reports changes after 1906 and they cease to contain much useful information.

A little used but invaluable source of information on Indian agriculture is contained in the cartographic records of the National Archives in Washington, D.C. Two indexes guide the researcher to the map records: Laura Kelsay, *List of Cartographic Records of the Bureau of Indian Affairs*, Special List no. 13 (1954) and Kelsay, *Cartographic Records in the National Archives Relating to Indians in the United States* (1971).

By far the largest and most complete source of information on Indian agriculture is found in the extensive collections of the National Archives and the collections of the several regional Federal Records Centers. Record Group 75 contains over 10,000 cubic feet of records on every subject dealing with Indian Affairs. Other Record Groups containing information on Indian agriculture are RG-48, Records of the Office of the Secretary of the Interior; RG-107, Records of the Office of the Secretary of War; RG-98, Records of the United States Army Commands; RG-192, Records of the Office of the Commissary General of Subsistence; RG-49, Records of the Bureau of Land Management, and RG-115, Records of the Bureau of Reclamation. Additional Archives holdings especially valuable for the 1930's are contained in RG-33, Records of the Federal Extension Service; RG-35, Records of the Civilian Conservation Corps; RG-95, Records of the Forest Service; RG-96, Records of the Farmers Home Administration, and RG-114, Records of the Soil Conservation Service. The Federal Records Centers contain additional records under the same record group numbers. Generally Federal Records Centers retain records that were for internal use on the reservations as well as reports and correspondence sent to Washington, D.C. Federal Records Centers in Seattle, Denver, and Kansas City have particularly complete records for the northern Plains and northwest reservations.

Much of the correspondence contained in Record Group 75 dated before 1881 is available on microfilm. Most National Archives microfilm is available through interlibrary loan from the Federal Records Centers. Searching the records dated before 1881 is time consuming and tedious. No indexes exist for these records. A Register was maintained of letters received until 1881. The Register consists of over 120 volumes. Between 1881 and 1906 both a Register and Index were maintained. The Register consists of over 140 volumes while the Index comprises another 37 volumes. After 1906 the Bureau maintained a decimal filing system that identifies subjects and jurisdictions. For records dated

after 1906 the researcher's difficulty is gaining a command of the vast quantity of material. Edward E. Hill, *Preliminary Inventories: Records of the Bureau of Indian Affairs* (2 volumes, 1965) is invaluable in finding your way through the mass of Indian records housed in the National Archives.

Research in Indian agriculture presents one with opportunities and challenges. Questions concerning Indian agriculture far exceed available answers. Further research will undoubtedly continue the ratio as new questions arise. Recent work, however, indicates that it is a rich field of inquiry for the researcher which can add measurably to our understanding of the past.

(Robert's ... *Florum Species*)

SELECTED LIST OF ARTICLES RELATING TO AGRICULTURE AND THE AMERICAN INDIAN

There is a growing concern for and interest in the American Indian inclusive of such research areas as anthropology, art, conservation, crafts, economics, environment, history, land use, law, and medicine. In particular, the involvement of the American Indian in agriculture has always been an important one; in this special issue, therefore, the editors have selected the following list of articles and annotations based upon an AGRICOLA (AGRICultural On-Line Access) search of the commercial data base *File 38: America: History and Life*. Through commercial on-line services, AGRICOLA currently provides access to more than 90 other data bases. Some of these files contain additional material pertinent to the subject of Agriculture and the American Indian. For further search information on this and many other agriculturally related subjects, contact Charles Bebee, Head, Automated Search Service, Room 111, National Agricultural Library Building, Beltsville, Maryland 20705.

Andersen, Raoul. "Agricultural Development on the Alexis Stoney." *Alberta Historical Review*, 1972, 20 (4): 16-20.

Relates the abortive attempt of the Canadian government, 1881-1901, to establish the Alberta Stoney (Assiniboine Indians) on the Alexis Reserve on an agricultural basis. 2 illus., biblio. D. L. Smith

Andrews, Isabel. "Indian Protest against Starvation: The Yellow Calf Incident of 1884." *Saskatchewan History* (Canada), 1975, 28 (2): 41-51.

Located on the Crooked Lakes Reserves in the Lower Qu'Appelle Valley, the incident of the title occurred because of a change in farm instructors and a strict enforcement of Department of Indian Affairs' rations policies. The firing of James Setter by Edgar Dewdney for laxity of policy enforcement and Hilton Keith's subsequent rigid enforcement of a new minimum rations policy established by Assistant Indian Commissioner Hayter Reed nearly brought on a revolt by Yellow Calf's Cree Indians. The validity of the Indians' complaints is documented from several contemporary sources. The incident portended the troubles of the following year. 60 notes. C. Held

Biery, James. "Tracing the Hopewell." *Northwestern Report*, 1968, 3 (4): 30-32.

Describes the archaeological search for the Hopewell Indian culture which flourished in western Illinois some two thousand years ago. While little is known of the Hopewell, preliminary findings indicate that they were a highly advanced culture which practiced agriculture and which carried on an extensive trade and commerce with neighboring tribes. Undocumented; 2 illus. G. Kurland

Clifton, James A. "Chicago Was Theirs." *Chicago History*, 1970, 1 (1): 4-17.

Traces the history of the Potawatomi Indians. Their origins are obscure but, by 1500 at the latest, they were moving westward along the northern shores of lakes Huron and Superior. They first came to the attention of the French explorer Samuel de Champlain in 1616. By the opening decades of the 18th century they were no longer small, scattered bands of hunters. As they pushed southward into prairie and woodland belts around Lake Michigan during the late 18th century, their mastery of agriculture and other pursuits promoted the growth of semisedentary bands. Their villages of Fort Saint Joseph, Fort Detroit, and Chicago had become quite large. Allied with the British, they took up arms against the United States during the Revolution. In 1833 the Federal Government expelled the Potawatomi from their lands in Wisconsin, Illinois, Michigan, and Indiana. After their removal west of the Mississippi River, they continued to resist change and assimilation, as they do to this day. Based on the author's forthcoming book, *The Prairie People*. Illus. D. J. Abramoske

Controneo, Ross R., and Dozier, Jack. "A Time of Disintegration: The Coeur d'Alene and the Dawes Act." *Western Historical Quarterly*, 1974, 5 (4): 405-419.

Following the Coeur d'Alene Treaty of 1889 which reduced the size of their reservation, the Coeur d'Alene Indians of northern Idaho believed they were safe from further incursion. Accordingly they established a viable and prosperous agricultural economy. For various reasons, over the next several years, the tribe sold off additional parts of the reservation. In 1905 the federal government began to apply the General Allotment Act (Dawes Severalty Act of 1887). As a result, most of the Indians lost their lands to creditors, and almost all semblance of tribal organization and pride. The Coeur d'Alene rejected the Indian Reorganization Act (Wheeler-Howard Act of 1934) which afforded opportunity for the reestablishment of its tribal government and a revival of its disappearing culture. This was a costly error. 47 notes. D. L. Smith

Cutler, Lee. "Lawrie Tatum and the Kiowa Agency, 1869-1873." *Arizona and the West*, 1971, 13 (3): 221-244.

Iowa Quaker farmer Tatum became agent of the Kiowa Indian Agency in southwestern Indian Territory (Oklahoma) in the summer of 1869. He was to implement the new Federal Peace Policy by checking the raiding propensities of the Kiowa (whose culture was war-centered) by anchoring them to their reservation and by encouraging them to become sedentary farmers. His efforts resulted in construction of agency buildings, opening of a school, and introduction of full-scale cultivation. Tatum's Quaker reliance on peaceful measures to win the confidence of the Kiowa and Quaker rejection of the idea of use of the military force to keep them on the reservation only resulted in open scorn and defiance for his efforts. Frustrated and disillusioned over the Peace Policy, Tatum resigned and was replaced in early 1873 by another Quaker. 4 illus., 2 maps, 52 notes. D. L. Smith

Deloria, Vine, Jr. "Indian Affairs 1973: Hebrews 13: 8." *North American Review*, 1973, 258 (4): 108-112.

Traces Indian affairs from the 19th-century emphasis on the evolutionary necessity of agriculture through the ramifications of land allotments begun in 1887 to the turning point under John Collier with the Pueblo Lands Act of 1924 and Collier's subsequent influence.

DeRosier, Arthur H., Jr. "Thomas Jefferson and the Removal of the Choctaw Indians." *Southern Quarterly*, 1962, 1 (1): 52-62.

Although Jefferson considered making private landowning farmers and mechanics of the Indians, as President his policy was simply that of acquiring land from them. From 1801-03 negotiators signed three separate treaties with the Choctaw nation in the Mississippi Territory which netted some three million acres. The whites of the southwest were not satisfied, however, and so federal policy grew devious in an effort to hold white loyalties against various separatist intrigues. The Indians were encouraged to purchase more goods than they could pay for and then were called to account. In 1805 the Choctaw agreed to exchange 4,142,720 acres for 50 thousand dollars cash, nearly all of which was needed to settle debts the Indians had incurred with a single trading firm. Jefferson was not proud of his agents' handiwork and he withheld the treaty from the Senate until trouble with Spain became acute in 1807. The Senate ratified the treaty early in 1808.

Fliegel, Frederick C., Kivlin, Joseph E., and Sekhon, Gurmeet S. "A Cross-National Comparison of Farmers' Perceptions of Innovations as Related to Adoption Behavior." *Rural Sociology*, 1968, 33 (4): 437-449.

"Two Pennsylvania samples were compared with an Indian sample on farmers' perceptions of attributes of innovations as related to adoption behavior. The Indian data were generally similar to those from small-scale Pennsylvania dairymen. Capital investment and substitution of technology for human labor are disincentives to adoption for both. The reverse is true for middle-scale Pennsylvania dairymen. Unlike either Pennsylvania sample, the Indian respondents attach considerable importance to social approval but little to financial return. More intense commercialization of agriculture may have to occur before financial incentives influence adoption in that setting."

Fonaroff, L. Schuyler. "Conservation and Stock Reduction on the Navajo Tribal Range." *Geographical Review*, 1963, 53 (2): 200-223.

Analyzes the livestock reduction program begun as a conservation measure by the federal government in the 1930's, with reference to some of the human problems involved in the Navajo country in northeastern Arizona. The first attempts to reduce the livestock met with resistance by the Indians, who could not comprehend its purpose. The destructive native grazing techniques here described have still not been replaced by the agronomist's rational grazing pattern. In many areas where agriculture or seasonal wages might have produced more income, most Navajos still felt that the traditional sheep raising had a social value that outweighed the economic. The end of the reduction program in most districts was followed by a marked stock increase despite the fact that the range was continually deteriorating. Illus., map, table, 47 notes. Edith P. Stickney

Glassner, Martin Ira. "The New Mandan Migrations: From Hunting Expeditions to Relocation." *Journal of the West*, 1974, 13 (2): 59-74.

Account of the migration of the Mandan Indians from the Ohio Valley up the Missouri River. Epidemics of smallpox and cholera reduced their size from 15,000 to a few hundred and forced them in 1862 to join the Arikaras and Hidatsas in a village called Like-a-Fishhook, on the Fort Berthold Reservation in North Dakota. The Three Affiliated Tribes continued to combine agriculture with hunting, but hunting became less and less important. The process of acculturation has continued to shrink the number of full-blooded Mandans, "until, in 1970, only one was recognized by the Bureau of Indian Affairs, 97-year-old Mrs. Mattie Grinnell." 3 maps, biblio., appendix. D. D. Cameron

Halliburton, R., Jr. "Origins of Black Slavery among the Cherokees." *Chronicles of Oklahoma*, 1974/75, 52 (4): 483-496.

Before the arrival of Europeans, slavery existed in various forms among the Indians. White traders introduced black slavery to the Cherokee Indians, who traded slaves with the English and French colonists. The Treaty of Dover (1730) provided that Cherokees would capture and return runaway slaves to English owners. After the American Revolution the Cherokees increased their use of black slaves, as they moved toward private land holdings and plantation farming. By the 1820's, "Black Codes," regulating slavery and intermarriage, became a part of Cherokee law. Slavery as practiced by the Cherokee Nation was similar to that of the rest of the South. Secondary sources; 2 photos, 45 notes. N. J. Street

Herndon, G. Melvin. "Indian Agriculture in the Southern Colonies." *North Carolina Historical Review*, 1967, 44 (3): 283-297.

Southeastern Indians were not only hunters but also sedentary farmers as well, and they contributed much to the survival of the early colonists and to American agriculture. Their cleared fields enabled whites to survive in the early years, for example. Indians did not sow broadcast as Europeans did, but planted in rows and hoed out the weeds; they practiced field rather than crop rotation, and had well developed techniques for growing such indigenous American plants as corn. All of these practices were adopted by the settlers, as were most of their crops, not only corn, but also melons, tobacco, and squash. 58 notes. J. M. Bumsted

Hicks, Frederic. "The Influence of Agriculture on Aboriginal Socio-Political Organization in the Lower Colorado River Valley." *Journal of California Anthropology*, 1974, 1 (2): 133-144.

Discusses the influence of agriculture in a river valley environment on the Yuman speaking peoples of the lower Colorado River Valley.

Horn, Kurt Van. "Tempting Temecula: The Making and Unmaking of a Southern California Community." *Journal of San Diego History*, 1975, 20 (1): 26-38.

Describes the history of the southern California town of Temecula from its first Indian inhabitants in the 11th century through its years as a Spanish town, ending with its agricultural development in the 19th century and economic death by 1890.

Horsman, Reginald. "American Indian Policy in the Old Northwest, 1783-1812." *William and Mary Quarterly*, 1961, 18 (1): 35-53.

The consistent aim throughout this period was to acquire Indian land from the Ohio to the Mississippi. The view of Washington and Philip Schuyler, that

land seizures were justified by the Indians' aid to the British, prevailed until 1787, at which time Henry Knox's policy of peace and absorption was substituted. Jefferson sought to encourage Indian agriculture and manufacturing, to release hunting land for settlers, transmuting acquisitiveness into "lofty moral purpose." The acquisition policy succeeded, but peace was not achieved, for "wholesale land acquisition and friendship with the Indians were incompatible." E. Oberholzer, Jr.

Hudson, John. "Two Dakota Homestead Frontiers." *Annals of the Association of American Geographers*, 1973, 63 (4): 442-462.

"Between 1870 and 1910 the northern plains was transformed from Indian reservation to a farming frontier for whites as a result of decisions made outside the region and by the adaptations of white and Indian settlers . . . ."

Ironsides, R. G., and Tomasky, E. "Development of Victoria Settlement." *Alberta Historical Review*, 1971, 19 (2): 20-29.

History of Victoria, from settlement as an Indian mission to present farming community status. Consideration of Indian land claims, establishment of Hudson's Bay Company trading post, and character of population. H. M. Burns

Jackson, Donald. "William Ewing, Agricultural Agent to the Indians." *Agricultural History*, 1957, 31 (2): 3-7.

Thomas Jefferson and the men about him believed that the problems of persuading the American Indian to live at peace with white men could be solved by teaching agriculture to him, because the Indian could thus sustain himself on a much smaller area of land. With this objective, William Ewing was sent as an agricultural agent to the Sauk and Fox nations along the upper Mississippi in 1805. His efforts were, however, unsuccessful. The Indians were already adept at raising corn, squash, pumpkins and other crops, and were not willing to give up hunting for livestock husbandry. J (W.D. Rasmussen)

James, Rhett S., ed. "Brigham Young-Chief Washakie Indian Farm Negotiations, 1854-1857." *Annals of Wyoming*, 1967, 39 (2): 245-256.

Presents a series of six letters from Brigham Young to Shoshone Chief Washakie during the years 1854 to 1857. These demonstrate Brigham Young's desire to live peacefully with the Indians, as well as his realization that the Indians had to become farmers if they were to survive. Based on the Brigham Young Papers, Church Historian's Office, Salt Lake City, Office of Indian Affairs material in the National Archives, and published material. 39 notes. R. L. Nichols

Jennings, Francis. "The Indian Trade of the Susquehanna Valley." *Proceedings of the American Philosophical Society*, 1966, 110 (6): 406-424.

Examines the Indian trade with whites in Pennsylvania's Susquehanna Valley during the period from around 1675 to about 1740. This trade between Indians and colonials led to a significant alteration in the economic outlook and activities of the Indians, causing them to neglect agricultural endeavors to concentrate on trapping and hunting furs. The drive for furs led in turn to destructive exploitation of available game which further led to clashes among the tribes for the reduced hunting areas. There was also a considerable struggle between the French and British traders for control of the lucrative traffic. James Logan, William Penn's secretary, was at once merchant, land speculator, and colonial official; his efforts were instrumental in determining the development of the Indian trade and of the advancing frontier. The author insists that the formative period in the Susquehanna Valley differed substantially from the hypotheses postulated in the customary frontier theory: both the Indians and the whites were dependent on Logan—for the fur trade and for land titles, respectively—thus causing an authoritarian rather than a democratic milieu to exist on the Pennsylvania frontier. Based largely on various published and unpublished primary sources. 89 notes. W. G. Morgan

Jett, Stephen C. "The Destruction of Navajo Orchards in 1864: Captain John Thompson's Report." *Arizona and the West*, 1974, 16 (4): 365-378.

As a part of the U.S. Army's effort to relocate troublesome Mescalero Apache and Navajo Indians on a reservation, cavalry Captain John Thompson (b. 1840) led an expedition through the Canyon de Chelly country of the Navajo in the summer of 1864. He did bring the surrender of some Navajo that had evaded earlier efforts, but his major thrust was a systematic eradication of their field crops and orchards. His destruction of 4,150 peach trees was crucial as peaches were their principal food item and trade commodity. The details of the effort are supplied in a letter report, reproduced here, that Thompson sent to a superior. Reconstructs Thompson's route through the Navajo agricultural heartland in northeastern Arizona. 2 illus., map, 21 notes. D. L. Smith.

Knowlton, Clark S. "Changing Spanish-American Villages of Northern New Mexico." *Sociology and Social Research*, 1969, 53 (4): 455-474.

"The Spanish Americans of northern New Mexico and southern Colorado living in isolation from other European groups for almost three hundred years developed a unique rural farm village culture based upon subsistence agriculture, pastoral activities, barter, handicrafts, and trade with the Indians. Until very recently each village was a small isolated, self-sufficient, autonomous social cell. The social structure of the village was structured upon four interrelated social systems: 1) the village community, 2) the patriarchal extended family, 3) the patron system, and 4) folk Catholicism. The extension of American control, the massive loss of range and farming land, the emigration of young adults, increasing acculturational and social differences, and finally the breakdown and malfunctioning of the traditional social systems have created a large apathetic poverty-stricken village population unable to live in the traditional manner or to develop the necessary social mechanisms to adjust to the dominant Anglo American society."

Lawton, Harry W. "Preliminary Reconstruction of Aboriginal Agricultural Technology among the Cahuilla." *Indian Historian*, 1968, 1 (5): 18-24.

Believes that the agricultural technology of the Cahuilla Indians of southern California came from Colorado River Indian diffusion rather than from Spanish introduction.

Lawton, Harry W.; Wilke, Philip J.; DeDecker, Mary; and Mason, William M. "Agriculture among the Paiute of the Owens Valley." *Journal of California Anthropology*, 1976, 3 (1): 13-50.

Examines the agriculture of the Paiute Indians in California's Owens Valley taking into account natural flora, irrigation techniques, geography, and cultural surrounding prehistory-1859. 2 photos, 2 illus., 10 maps, 2 tables, 19 notes, biblio.

Lopez, Ruben E. "Life in the Missions: Life on the Ranchos." *Pacific Historian*, 1969, 13 (2): 1-16.

Life for the California Indians changed considerably after the advent of the Franciscans and the establishment of the missions: it was more regimented and frequently involved harsh discipline. The mortality rate among the Indians was staggering, and no effort was made to educate them or teach them to think and act for themselves. Nonetheless their overall lot was improved, and under Father Junipero Serra possibly the dream of a utopia was realized. The missions' most outstanding contribution was the introduction of agriculture into California. The great rancheros followed the missions. On these self-sustaining economic and social units the ranchero ruled with an iron hand, raising cattle with the help of Indian labor. The rancheros were so famed for their hospitality and entertainment that early American writers thought California the happiest community in the world. Secondary sources; 7 illus., map, 32 notes. F. I.Murphy

Lukaczer, Moses. "National School Lunch Program and Indian School Children." *Indian Historian*, 1974, 7 (1): 17-23.

Martin, John F. "The Organization of Land and Labor in a Marginal Economy." *Human Organization*, 1973, 32 (2): 153-161.

Examines the lack of gardening on available land by the poverty-stricken Havasupai Indians in northwestern Arizona. The seemingly irrational lack of needed production is most rational, considering that the increased crop production would have brought no additional cash income and considering the Havasupai family organization. 7 notes, biblio. E. Johnson.

Martone, Rosalie. "The United States and the Betrayal of Indian Water Rights." *Indian Historian*. 1974, 7 (3): 3-11.

Discusses the Central Arizona Project (1970-74) designed to divert Colorado River waters away from Indian land to southern Arizona.

Meyer, Roy W. "Fort Berthold and the Garrison Dam." *North Dakota History*, 1968, 35 (3/4): 216-335.

The Fort Berthold Indian Reservation was created in 1851 as the home of the Hidatsa, Mandan, and Arikara. Here the Indians concentrated principally on agriculture in the bottomlands of the Missouri River that traversed the reservation. The Garrison Dam, erected by the Government as a flood control project, brought their relocation in the late 1940's and early 1950's and disrupted their way of life. The Indians were thus presented with what they regarded as another example of white persistency in forcing Indian adoption of white middle-class ways. Resettled in new homes with comforts and amenities they neither coveted nor needed, the Indians could not find employment to maintain themselves properly in their new situations. Whatever white intentions were, Indian-white relations were given a setback. 18 illus., 2 maps, 324 notes. D. L. Smith.

Moodie, D. W., and Kaye, Barry. "The Northern Limit of Indian Agriculture in North America." *Geographical Review*, 1969, 59 (4): 513-529.

"At the time of European contact the northern limit of Indian agriculture on the Great Plains was in the Upper Missouri region. Then in 1805 a gift of seed corn to some immigrant Ottawas at Netley Creek, at the southern end of Lake Winnipeg, led to the establishment of Indian gardens there. From Netley Creek, and later from Plantation Island in Lake of the Woods (to which the Netley Creek Ottawas migrated in 1812), agriculture spread among the Saulteaux Indians of the Manitoba plains and of the adjacent woodlands of Ontario and Minnesota. Indian corn reached its northern limit in the Mossy River area. All evidence suggests that short-season Mandan flint corn from the Upper Missouri was the source of the original seed. The traditional corn-bean-squash-pumpkin complex of the North American Indians was found as far north as Plantation Island, beyond which it could not survive as a complete complex. Except for potatoes, few crops of European origin were grown."

Morton, W. L. "A Century of Plain and Parkland." *Alberta Historical Review*, 1969, 17 (2): 1-10.

Discusses the role of the plains in the life of the Indian, the fur trader, and the early farmer, considering the impact of the East upon the settlement of the West and of the significant differences that existed. Helen M. Burns.

Pike, Donald. "The People Who Have Vanished." *American West*, 1973, 10 (6): 40-47.

The Anasazi Culture (from the Navajo, "The Ancient Ones") occupied the Four Corners area of the Southwest for the first 13 centuries A.D. Their agricultural and urban culture, including creative arts and a highly formalized religion, flourished while other American Indian cultures were comparatively primitive. Their best-known manifestations now are in the Mesa Verde National Park in southwestern Colorado. At best, their origins and their disappearance remain mysteries. Adapted from a forthcoming book. 4 illus. D. L. Smith

Rainwater, Percy L. "Indian Missions and Missionaries." *Journal of Mississippi History*, 1965, 28 (1): 15-39.

Describes the mission of the Reverend Joseph Bullen, a Presbyterian minister, at the Chickasaw Towns, 1799-1802; the development of the federal policy of encouraging agriculture and domestic manufacturing among Indians, which culminated in the enactment of "the so-called Civilization Law" of 1819; and the Presbyterian mission which the Reverend Thomas C. Stuart established in the Chickasaw nation in 1821.

Ricciardelli, Alex F. "The Adoption of White Agriculture by the Oneida Indians." *Ethnohistory*, 1963, 10 (4): 309-328.

Re-examines Oneida society and culture through three stages, in three environments (New York, Wisconsin, Ontario), stressing five factors that made farming the prevailing mode of life by 1860: necessity, tribal ideals, a strong horticultural tradition among women, precept and example of helpful Indian and white neighbors, relocation. H. J. Graham

Richards, Lewis A. "The Story of the Mimbres Indians." *Western Review*, 1973, 10 (1): 3-39.

About 900 A.D. the Mimbres Indians began a 250-year settlement along the Mimbres River in New Mexico. Describes their houses, tribal economy (including hunting, seed-gathering, and some farming), pottery, burial customs, human sacrifice, and artificial cranial deformation. The Mimbres moved south and apparently soon lost their identity. Map, 7 photos, 52 notes, biblio. W. J. Furdell

Sabine, David B. "The All-American Grain." *American History Illustrated*, 1967, 2 (1): 12-17.

Discusses the importance of corn to civilization from the pre-Columbian Indian cultures to the present complex industrial world. Emphasis is on the economic role of grain from the subsistence farming of colonial times to the present-day farmer-businessmen. F. J. Stachowski

Searle, Newell. "Minnessota National Forest: The Politics of Compromise, 1898-1908." *Minnesota History*, 1971, 42 (7): 243-257.

Explains how state conservation groups compromised on legislative proposals that led to the creation of the Minnesota National Forest in 1908. Controversy over timber harvesting on ceded Chippewa Indian land prompted the Minnesota Federation of Women's Clubs to propose that Congress make the area into a national park in 1899. After other groups and individuals offered conflicting proposals, the women adopted the forest reserve plan of Herman Haupt Chapman, a University of Minnesota forester. The united conservationists encountered stiff opposition from northern Minnesota middle-class farmers and entrepreneuers who hoped to exploit local land and timber resources to the fullest, but Chapman and Gifford Pinchot, Chief of the U.S. Forestry Bureau, persuaded the state congressional delegation to co-sponsor a bill creating the Minnesota Forest Reserve. Congress passed this measure in 1902 and approved the Minnesota National Forest Act six years later. Based on primary and secondary sources; illus., 7 photos, map, 48 notes. G. R. Adams

Sears, William H. "Food Production and Village Life in Prehistoric Southeastern United States." *Archaeology*, 1971, 24 (4): 322-329.

"It is hypothesized that the arrival of an economically important system of agriculture in an area would produce villages and increases in population and social complexity. It is further asserted that the beginnings of complex society will usually be most visible through the development of ceremonialism. The hypothesis is shown to be valid in the southeastern United States in two cultural sequences. In the northern Florida-South Georgia area, population increase and areal spread coincide with the advent of Hopewell ceremonialism. Corn is present in Hopewell in the North. In south central Florida, real population increase has not been shown, but there is great increase in population complexity, as demonstrated by the introduction of Hopewell ceremonialism which appears with corn agriculture."

Stevens, Michael E. "Catholic and Protestant Missionaries among Wisconsin Indians: The Territorial Period." *Wisconsin Magazine of History*, 1974/75, 58 (2): 140-148.

Compares Catholic and Protestant missionary attitudes toward the Indians in the Wisconsin territory, revealing that both denominations wished to encourage a stable agricultural life among the Indians in order to promote Christianity and to acculturate the Indians, who would otherwise face extinction with the advancing frontier. . . . 12 illus., 42 notes. N. C. Burckel

Stewart, Kenneth M. "Mojave Indian Agriculture." *Masterkey*, 1966, 40 (1): 5-15.

Describes in some detail the agricultural practices of the Mojave Indians, prior to contact, in the Colorado River floodlands of southern California and Arizona. Principal crops were maize, tepary beans, melons, pumpkins, sunflowers (for the seeds), and gourds (for use as receptacles or rattles). Mojave agricultural methods were relatively simple, involving planting on the floodplain immediately following subsidence of the spring floods, and a fall harvest. Both crop rotation and artificial irrigation were superfluous, due to the richness and moisture of the silt deposited by the floods. The author also notes several agriculturally-related cultural practices. Based on primary and secondary sources; 5 illus., biblio. C. N. Warren

Sunseri, Alvin R. "Agricultural Techniques in New Mexico at the Time of the Anglo-American Conquest." *Agricultural History*, 1973, 47 (4): 329-337.

In the arid region of New Mexico a highly complicated system of dryland irrigation developed as a result of the blending of Pueblo Indian and Mexican American cultures. Water scarcity necessitated communal effort to assure a reliable supply. Mayordomos (ditch chiefs) supervised the construction and maintenance of extensive irrigation systems and with the cacique controlled access to available water. In large undertakings such as the construction of an acequia madre (mother ditch) landowners had to provide the necessary laborers. Many of the irrigation systems in this area go back to Spanish customs of management. Americans entering the area later, critical of the native subsistence level, introduced "pro-

gressive" methods of agriculture though the value of water diminished little. Based on primary and secondary sources; 32 notes. R. T. Fulton

Simmons, Marc. "An Alcade's Proclamation: A Rare New Mexico Document." *Palacio*, 1968, 75 (2): 5-9.

Presents a translation of the proclamation of Alcade Don Ignacio Maria Sanchez Vergara, dated 25 April 1813, which represents an important contribution to understanding the local government in New Mexico during the colonial period. The document provides information on master-servant relations, irrigation practices, and the kind of protection provided for the Indians' farm land from the grazing livestock of the Spanish colonists. 6 notes. S. A. Eger

Singleton, W. Ralph. "Agricultural Plants." *Agricultural History*, 1972, 46 (1): 71-79.

Discusses plants common in the United States between 1790 and 1840, pointing out that in many cases they were similar to the ones grown during the colonial period. Emphasizes especially crops that were obtained from the Indians. Of these, the most important were corn, squashes, and beans. Others worth mentioning include green peppers, husk tomatoes, potatoes, sweet potatoes, and sunflowers. Based mainly on secondary sources; 13 notes. D. E. Brewster

Smaby, Beverly P. "The Mormons and the Indians: Conflicting Ecological Systems in the Great Basin." *American Studies*, 1975, 16 (1): 35-48.

Focuses on the conflict during 1847-60 when Indian defeat was inevitable. Indian tribes remained flexible and in harmony with the natural ecological system, while Mormons pursued eastern methods of intensive agriculture in nucleated settlements. The two systems quickly conflicted and Indian culture deteriorated under relentless Mormon pressure and population growth. Primary and secondary sources; 56 notes. J. Andrew.

Smith, Lowell, and Deuel, Pamela. "The California-Nevada Interstate Water Compact: A Great Betrayal." *Cry California*, 1972, 7 (1): 24-35.

The history of the Truckee-Carson River water basin system. Pyramid Lake (Nevada), the Paiute Indians, and much wildlife all have been sacrificed to the agriculture interests of the Truckee-Carson Irrigation District. Now, only action by the U.S. Congress can restore Pyramid Lake to its former water level. R. Righter

Trees, May. "Socioeconomic Reconstruction in the Seminole Nation, 1865-1870." *Journal of the West*, 1973, 12 (3): 490-498.

The Civil War left the lands of the Seminole Indians in ruins. However, a new treaty was soon signed and new lands acquired. The Seminoles began farming and made great economic improvements. Social advances were slower, but steady, and by 1870 Seminole Indians were prosperous and well-governed. 27 notes. V. L. Human

Tucker, Norma. "Nancy Ward, Ghighau of the Cherokees." *Georgia Historical Quarterly*, 1969, 53 (2): 192-200.

A biography of a woman leader of the Cherokee during the Revolutionary and national periods who received the honored title of Ghighau, meaning "beloved woman." When her Cherokee husband died in a 1755 battle with the Creek, Nancy Ward joined the fight with his weapon. She later married a British Indian trader named Brian Ward. She helped promote peaceful relations with Americans during the Revolution and after, encouraged agricultural improvements among her people, and fought against Indian removal. R. A. Mohl

Upton, L. F. S. "Indian Affairs in Colonial New Brunswick." *Acadiensis (Canada)*, 1974, 3 (2): 3-26.

The first Indian program in New Brunswick, developed by Lieutenant Governor Sir William Colebrook and Moses H. Perley in the 1840's, attempted to settle the natives as farmers on individual lots, eliminating annual relief payments. The remaining lands would be leased, creating funds for social uplift projects; white squatters would be kicked off. The assembly, instead, tried to sell the excess lands and create a relief fund. Their plan failed, resulting in the sale of nearly 20% of Indian lands. Based on archives and primary sources; 106 notes. E. A. Churchill

Waitz, Lawrence T. "The Indians of Eastern Long Island." *Long Island Forum*, 1970, 33 (9): 182-186.

The Indians of eastern Long Island did not form distinct tribes. They were basically of Algonkian stock and included Delaware, Niantick, and Mohegan Indians. By the time the first whites arrived on Long Island around 1640, the island's Indians were paying tribute to the Pequot and Narragansett of New England. Having no conception of private property, they felt that the white settlers were paying them tribute when they purchased their ancestral lands. Economically, the Indians of eastern Long Island were food gatherers and fishermen living primarily on clams, scallops, and oysters. Agriculture was practiced by the squaws who cultivated corn, squash, and beans. Their lodgings were constructed of thatch over a framework of bent saplings. A serious plague from 1615 to 1620 seriously weakened their ability to resist white encroachment. 2 illus., biblio. G. Kurland

White, Richard. "Indian Land Use and Environmental Change, Island County, Washington: A Case Study." *Arizona and the West*, 1975, 17 (4): 327-338.

The Clallam, Kikialos, Skagit, and Snohomish, all Salish Indian tribes, occupied Whidby and Camona islands in Puget Sound off the Washington coast from about 1000 A.D. They played an active and direct role in shaping their environment to fit their own needs. Using fire and a simple technology over many generations, the Salish created and maintained an impressive ecosystem. They encouraged the growth of bracken, camas, and nettles, three dominant plants that supplemented their regular diet of fish and small game. They also created conditions that fostered large forests of Douglas fir. The Salish environment changed at a staggering rate in the 1850's, however, as the Indians adapted to the new tools and techniques of the white farmers. 7 illus., map, 27 notes. D. L. Smith

Wilson, Charles Morrow. "Are We Growing the Right Crops?" *Modern Age*, 1968, 12 (3): 281-294.

Cites the current and projected world food crisis and finds salvation not in present food production but in the development of more crops. Notes that America has forgotten at least 50 cultivatable crops that are restorable, including the Jerusalem artichoke, "Indian parsnip," and wild sweet potatoes, which are all quite nutritious. Developing "lost" crops, along with greater vegetable yields, enlightened plant genetics, and improved staple crops and seeds, could help immeasurably to feed mankind. Primary and secondary sources. M. J. Barach

Winter, Joseph Charles. "Aboriginal Agriculture in the Southwest and Great Basin." *Dissertation Abstracts International*, 1974, 35 (1): 18-19-A; published by University of Utah, 1974, 199 pp.

Wishart, David. "Agriculture at the Trading Posts on the Upper Missouri prior to 1843." *Agricultural History*, 1973, 47 (1): 57-62.

The poor soil and dry climate of the Upper Missouri, combined with plentiful buffalo and with Indians willing to trade food, prevented trading posts from achieving agricultural self-sufficiency. Trading-post agriculture typically consisted of garden horticulture and stock fed on local hay; nevertheless, trading posts were among the earliest sites of Anglo-American farming on the Great Plains. Based on material in the Missouri Historical Society; 29 notes. D. E. Brewster

Yarnell, Richard A. "Iva Annua Var. Macrocarpa: Extinct American Cultigen?" *American Anthropologist*, 1972, 74 (3): 335-341.

Exceptionally large sumpweed achenes have been recovered from archaeological sites in the region extending from Kansas City and the Ozarks to eastern Kentucky and western North Carolina. Dates of occupation range from early first millennium B.C. to the first half of the second millennium A.D. Achene size progressed from slightly larger than modern achenes of the earliest sites to double the modern length at later sites. This is taken as evidence of evolution under domestication. AIA (3:4:1572) J.

Young, Mary. "Indian Removal and Land Allotment: The Civilized Tribes and Jacksonian Justice." *American Historical Review*, 1958, 64 (1): 31-45.

Land allotment policies were applied to the Southeastern Indian tribes in the 1830's with a twofold purpose: to cause the Indians to emigrate or to force them to take up a stable agricultural pursuit which would limit the amount of acreage they occupied. The motives were to make more land available for white settlement without giving the appearance of having violated the principle of voluntarism. The effects of the policy were to leave the Indians landless and to deliver the lands into the hands of speculators. R. C. Raack

At the Navajo Tribal Fair, Navajo girl and the grand champion steer which she raised as a 4-H project (Courtesy, Bureau of Indian Affairs—Department of the Interior).

BOOK REVIEWS

Persons interested in reviewing books, having books reviewed, or simply having questions about the reviews should address correspondence to Tom Fulton, Book Review Editor, Associates NAL Today, *Room 150, GHI Building, 500 12th Street, S.W., Washington, D.C. 20250.*

Cohen, Nathan M. *Food Crises in Prehistory: Over-population and the Origins of Agriculture.* (New Haven, Conn.: Yale University Press, 1977, 341 pp., $15.00.)

Until recently very little attention has been paid as to why agriculture was adopted as an economic behavior. One school of thought was that once agriculture was invented, the benefits of this type of system would be obvious to everyone and adopted universally. A second theory was that agriculture emerged as a result of stress and disequilibrium in subsistance patterns. The stress and disequilibrium, however, were the results of external or environmental forces rather than anything human.

Mark Nathan Cohen in his new book *Food Crises in Prehistory: Over-population and the Origins of Agriculture* contends that a steady growth in population and the eventual changeover from foods most enjoyed to secondary less pleasurable comestibles was the reason for the start of agriculture as a viable economic behavior.

At the end of the pleistocene age (2 million to 12 thousand years ago) and the beginning of the holocene age (12 thousand years ago to the present) there was a climatic change. With this change came the extinction of a great deal of the large fauna. Man had to settle for smaller animals and supplement these with wild vegetables. With the exploitation of these vegetables, humans began to gain knowledge of horticultural practices long before they adopted agriculture. Cohen believes that population pressure on a worldwide scale was the stress factor that really caused man to adopt agriculture.

The author makes arguments for population increase in both the old and new worlds separately. In both the Eastern and Western hemispheres Cohen says that the preferred mode of economics was hunting. He also states that for small groups, hunting and gathering was a more efficient way of earning a living than agriculture. It was also more fun (there must have been some great stories around those campfires), took less work, and provided a greater variety in their diet than agriculture. So why would any people adopt agriculture if hunting was such a great way of life? They were starving. Territories staked out for hunting were beginning to be crowded. With increase of population the people in many areas had to turn to a method which would allow them to gain a higher yield of foodstuffs on the same amount of land: "agriculture." *Food Crises in Prehistory . . .* is a valuable addition to the ongoing discussion of the origins of agriculture. In this well written, though technical, book is provided a sound framework for the theory that the adoption of agriculture was a means to adjust to a crisis situation.

Reviewed by Cecil Harvey, Economics, Statistics, and Cooperatives Service, USDA.

Rutman, Darrett. *Husbandmen of Plymouth; Farms and Villages in the Old Colony, 1620-1692.* (Boston: Beacon Press, 1967, 100 pp.)

The author, a professor at the University of Minnesota, was invited by Plimoth Plantation, Inc. to write this book. His objective as stated in his preface is to give a good account of agriculture which pinpoints the individual farmer and his daily and weekly tasks, yet keeps the individual within the context of the entire Atlantic commercial community. He uses the "Old Colony" of Plimoth as a backdrop to portray the interaction of this detail of daily life with the broader historical trends of that time.

After establishing that the first Englishmen that landed at Plymouth were not farmers, Rutman poses and then attempts to answer three questions: first, how did Plymouth become an agricultural colony; second, from whom did the settlers learn their farming; and third, how great was their committment to the soil? Discussion of these questions leads him inevitably to the Indian contribution, a literal lifesaver, of corn, and he notes that the Indian of the Northwest was not so much the stereotype hunter as an agricultural being who cleared land about his village by burning grass and girdling trees, and grew corn and other crops. The Indian agricultural traditions and methods are described in detail. Indian men and women broke up the soil in small circles two feet across and two or three feet apart, each hilled toward the center. Then the women planted grains of corn in the center of each circle, in some areas fertilizing by burying a small herring-like fish, the alewife, along with the seed. Beans were planted around the young corn plants, later climbing the cornstalks. Squash and pumpkins were sometimes planted too. All summer long the Indian women worked in the fields using a crude clam-

shell hoe to weed and cultivate some nine hundred hills on 2 1/2 acres, which then yielded 40-45 bushels of corn.

The Plymouth settlers saw the Indian cornfields and the harvested grain stored in baskets and later learned to plant it Indian style, though the Indian method was soon modified by less arduous English ways. As population increased through migration from England and later through natural means, Plymouth farmers planted less corn and more grain. Many became prosperous by trading it with the newcomers. As they moved away from Indian methods, the Plymouth farmers reverted to traditional English methods. The trading brought prosperity and families moved away from the original colony to larger fields forming a rambling collection of towns. All of the settlers were committed to the soil. They either farmed the land or depended on it for their incomes through a complicated barter system. The economy of the Old Colony remained basically agricultural until 1692.

In the second part of the book, Rutman reconstructs the farm of that time by gleaning clues from wills and inventories listed in town records. He concludes that the Plymouth settlers and others along the American coast were leaning toward extensive agriculture while England was moving toward intensive agriculture. In the third part of the book, Plymouth is compared to Massachusetts Bay and other colonies and described as "quietly backward" but nevertheless changing slowly over time without great contention. The Appendix contains additional inventories of other farms. There are two excellent sections of notes and sources listing books and articles and other sources with critical comments. This work is not only a source book, but a sound piece of research critical to the understanding of American agricultural development, and a must for any research collection.

Reviewed by Judi Ho, Technical Information Systems, Science and Education Administration, USDA.

Smith, Jane F. and Robert M. Kvasnicka, eds. *Indian-White Relations: A Persistent Paradox.* (Washington: Howard University Press, 1976. xx, 278 pp. illus., index, $15.00.)

Since 1967 the National Archives and Records Service has sponsored a series of meetings promoting the exchange of information between archivists and researchers. During mid-June, 1972, a two-day "Conference on Research in the History of Indian-White Relations" was held at the National Archives. Designed to "highlight the rich potential" of National Archives materials, the conference was attended by scholars from throughout the United States. The program consisted of a series of formal papers, commentaries, and discussions by leading members of both the historical and archival professions. *Indian-White Relations: A Persistent Paradox* contains the papers and proceedings of the conference.

Papers by Oliver W. Holmes and by Carmelita S. Ryan present an excellent overview of the various record groups relating to Indian-White affairs and the procedures used to collect and safeguard such documents. Holmes urges scholars to utilize a wide variety of materials, advising them that information about Indians can be found among the records of the War, State, Treasury, and Justice Departments, as well as the records of the Department of the Interior and the Bureau of Indian Affairs. He also mentions several valuable finding aids, and he champions the use of microfilm in making the records available to researchers across the country. Ryan concentrates her remarks upon the appraisal of Indian records, discussing past disposition decisions and outlining the Bureau of Indian Affairs present retention plan.

The papers and commentaries by historians offer a good statement of the status of Indian-White history during the early 1970's. Reacting against the plethora of "popularized" Indian histories that emerged around 1970, Francis Paul Prucha advises historians to "seek the truth," and "be alert to the pitfall of . . . too much sympathy . . . for one side or the other." Other papers focus upon problems of assimilation, military-Indian relations, the reservation system, and the Indian New Deal.

Several historians offer commentaries, but perhaps the most perceptive remarks come from Robert F. Berkhofer, Jr., and Mary Young. Charging that white philanthropists were so ethnocentric that they attempted to force a "cultural imperialism" upon the tribesmen, Berkhofer also suggests that nineteenth-century reformers and Indian agents had a "vested interest in the permanent helplessness of their wards." Young asserts that Indian reservations, like middle class suburbs and ethnic or racial ghettos, are part of a universal segregation system that develops when peoples of diverse cultures and attitudes come together. Although the reservation system was supposed to foster initiative among the Indians, Young argues that Indian agents rewarded submissiveness, since quiet, cooperative tribesmen were easily controlled. Complying with the wishes of the agents, docile Indians were rewarded by the Bureau of Indian Affairs and eventually developed a subculture adapted to following white directives. Therefore, during the 1930's, when John Collier introduced the Indian New Deal, these Indians opposed the measure, since the new legislation attempted to return the decision making process back to the tribal communities.

Unfortunately, like most studies of Indian-White relations, the majority of the papers included in this book focus more upon Whites than Indians. But the papers and commentaries do offer valuable insights into the formulation of American Indian policy. The volume should be welcomed by both archivists and historians. It also should be useful in Indian studies courses.

Reviewed by R. David Edmunds, Texas Christian University, reprinted with permission from *American Archivist,* Vol. 40, No. 2 (April 1977).

Vogel, Virgil J., *American Indian Medicine.* (Norman: University of Oklahoma Press, c1970, 1977, The Civilization Series, vol. 95, xx, 583 pp., $13.95); Scully, Virginia, *A Treasury of American Indian Herbs: Their Lore and Their Use for Food, Drugs, and Medicine.* (New York: Crown Publishers, c1970, 1971, xiv, 306 pp.,

$6.95 pap.); Weiner, Michael A., *Earth Medicine - Earth Foods: Plant Remedies, Drugs, and Natural Foods of the North American Indians.* (New York: Macmillan, 1972, x, 214 pp., $8.95, $4.95 pap.).

Prior to the arrival of the white man on the North American continent, the American Indian was experimenting with and effectively utilizing an exceedingly large variety of native herbs and plants for therapeutic purposes. For example, remarkable as it may seem, years before they were introduced by modern science, the Indian had found that certain plants could be used as cardiac stimulants, as local anesthetics (i.e. cocaine), and as oral contraceptives as well as for the treatment of scurvy, for abortions, ovulation suppression, and menstrual cycle control. The Indian can also be credited with discovering the fundamentals which later led to the development of insulin and modern antibiotics. Proof of the value of the Indian's contribution to and influence upon contemporary medical practice in this country is evinced by the fact that more than 200 indigenous drugs used by one or more Indian tribes have been listed either in *The Pharmacopeia of the United States* or in the *National Formulary* since their publication in 1820 and 1888, respectively. Interestingly enough, a large number of drugs used by the Indian correspond to those described in the *Dispensatory of the United States.*

Of the numerous accounts which have appeared over the years discussing various aspects of the indigenous drugs used by the Indian, many were written by early explorers, travelers, missionaries, herbalists, botanists, naturalists, ethnologists, physicians. Virgil Vogel, in a definitive treatise on the subject, has interwoven into his text a skillful blend of both primary and secondary sources. Seven chapters form the textual basis for the first part of the book commencing with a brief overview of those areas of medicine in which the American Indian's contributions have proved to be invaluable. In the second chapter, the reader is introduced to the Indian's concept of disease as well as to the ritualistic procedures involved in the medical treatment practised by the shaman or medicine man. The next three chapters deal with the interrelationship between Indian medical practices and the white man beginning with a description of observations by white explorers, missionaries, naturalists, and the like inclusive of Captain John Smith in Virginia, John Lawson, John Brickell, Thomas Ashe, and Mark Catesby in the Carolinas, and James Mooney, William Bartram, and John D. Hunter in the Trans-Allegheny and Trans-Mississippi West. Sweat baths, emetics, cauterizations, bleeding, sucking, and scarification are only a few of the treatments mentioned.

Due to the scarcity of trained medical men in the early days of the frontier, non-professional practitioners abounded ranging from ministers to "'yarb and root doctors'" to "barber-surgeons." The skill and reputation that the Indian had acquired in his experimentation with plants and herbs, therefore, was much utilized by explorers and frontiersmen alike and much exploited for personal gain by so-called white "Indian doctors" with their patent medicines alleged to be of Indian origin and their "Indian" medicine shows.

Chapter six discusses the physical condition of the Indian when first viewed by the European and at a later point in time after prolonged exposure to smallpox, veneral disease, intoxicants, and other afflictions of the white man. The seventh chapter considers the therapeutic methods practiced by the Indian emphasizing, in particular, those aspects which influenced the white man. Topics include the use of drugs (i.e. anesthetics, stimulants, cathartics, emetics, poisons, etc.), the treatment of internal ailments both with and without drugs, and the treatment of external injuries.

The second portion of the book or Appendix which is entitled "American Indian Contributions to Pharmacology" is a glossary of over 200 indigenous drugs used by the American Indian which were listed officially in the white man's *Pharmacopeia...* and the *National Formulary.* The arrangement is alphabetical by common name of plant followed by its preferred Latin name, any synonyms or alternate common names, its uses and importance including references to historical observations; the areas of coverage include, in order, botanical remedies, non-botanical remedies, and drugs of Latin American origin. In addition to an appropriate choice of illustrations, the author has included throughout the work, full well-documented footnotes which add immeasurably to the value of the text. An index of botanical names as well as a general index and an extensive bibliography conclude the work.

An historian with medical expertise, the author at no point attempts to judge the efficacy of the remedies and treatments that he describes; instead, he draws observations and thoughts from an array of primary sources and combines them with a flowing historical narrative to create a compendium of fascinating information. It is indeed rewarding to know that such a well-documented and in-depth research effort can satisfy, on the one hand, requirements for a doctoral dissertation and, on the other, provide so important and useful a contribution to today's literature on the history of American Indian medicine.

A brief mention should be made of two books which complement the subject matter of Vogel's work - Virginia Scully's *A Treasury of American Indian Herbs* and Michael Weiner's *Earth Medicine - Earth Foods.* In each case, the scope of the work varies for while Scully has limited herself geographically to a study of the Indians of the Rocky Mountain region, Weiner has included all North American Indian tribes. Scully's text which is divided into two sections - "Food and Drink" and "Maladies and Medicines" - is arranged in dictionary format. The first part is alphabetical by herb or plant name, the second by name of herb, plant, or medical problem. Each definition includes some or all of the following: location in which grown; brief description of physical characteristics; derivation of name; uses of by man and/or animal; additional information of historical nature when appropriate.

Weiner's text also is divided into two sections and the arrangement is an alphabetical one although, in the first section - "Earth Medicine" - it is by medical topic ranging from "Abortion" to "Wounds" and, in the second - "Earth Foods" - by type of edible plants from "Acorns" to "Seaweeds, Mushrooms, and Lichens." His definitions, by the very nature of the broad scope of his work, tend to be quite lengthy at times and to include substantial textual description.

In Scully's work, botanical names are used rarely and then only when needed for purposes of clarification.

The pen and ink illustrations which are sprinkled throughout the text are taken from Gerard's *Herball* (1636) and Dr. W. Beach's *The American Practice Condensed* (1848); there is no specific identification by book, however. The text itself is well-researched and makes for interesting as well as informative reading. The bibliography which is comprised mostly of secondary sources is adequate although the inclusion of a greater number of primary sources (i.e. travelers' accounts) would have added greatly to the historical value of the work. The index is only partially useful in that it provides a listing just for plants, herbs, and medical terms.

Although Weiner too excludes the use of botanical names from his text, he does provide two plant indexes to botanical names as well as a general index at the end of the work, the plant indexes arranged by English-Latin and Latin-English names. The text is richly illustrated with botanical drawings taken from Bentley's *Medicinal Plants* (1880), C.W. Millspaugh's *American Medicinal Plants* (1887), and Woodville's *Medical Botony* (1832). As with Scully's, Weiner's bibliography is adequate considering the nature of his work. There are no footnotes in either work and, although the addition would have added significantly to their value as research tools, neither the nature nor the format of the works requires their inclusion. Taken collectively then, these three works provide the reader and/or researcher with a wide and varied range of insights into the importance of American Indian medicine in the developemnt of Western civilization.

Reviewed by Donna Jean Fusonie, Smithsonian Institution Libraries.

Wessel, Thomas R. "Agriculture, Indians, and American History," in *Agricultural History*, Vol. 50, No. 1, Jan. 1976, pp. 9-20.

"Agriculture, Indians, and American History" is a nicely written, reasonably brief, and interesting account by Thomas Wessel of the significance of agriculture to American Indian history. "Concentration on the dramatic horseman of the plains," Mr. Wessel writes, "has clouded the significance of agriculture in Indian history," and has led largely to its being ignored by biased historians and chauvinist researchers. Believing Indians to be savages and savages to hunt, early historians, government policy makers, and frontiersmen entirely ignored the agrarian accomplishments of their Indian neighbors. And to some extent, Wessel maintains, modern historians still do. A form of racism was at work. And Wessel makes this clear. His essay is, in part at least, an attempt to correct this misinterpretation.

In fact, Wessel writes, agriculture had an importance to Indian history beyond that of providing only sustenance. It played an essential role in "linking Indian and white destinies on this continent" and "pervaded the history" of their contact. Wessel further maintains that Indian agriculture was a central factor in causing tribal warfare (he cites accounts of the Hurons and Iroquois); that it provided the fuel and impetus behind inter tribal and inter racial fur trading, with some successful trading nations abandoning their own farming habits in favor of securing the surplus products of other agricultural nations; and that agriculture even served as a catalyst for forming communicative links between hunting and agricultural people "that extended from the Upper Missouri to the Pueblo plateau in the southwest." Also, Wessel notes, surplus agricultural products fed and sustained the early settlers at Plymouth and Jamestown until the colonists were able to feed themselves, and even accounted for 65% of the native population's diet in Southern New England. Many an early settler feasted on Indian maize, squash, pumpkins, and beans, he writes, and Indian agriculture "provided the United States and a good portion of the world with its most prolific feed grain."

Much of Wessel's article is a survey summary retelling the above story and documenting research to support it, and it includes numerous references to various Indian nations throughout the continent. His writing style is mostly unadorned, but always clear, pleasant, and sometimes even rhythmic. His references are ample, and to my mind adequate, alternating between major secondary sources and other original texts—including laws, treaties, first hand accounts, and reports from the Commissioners of Indian Affairs. And, while Mr. Wessel is not writing a literature review article or intending his essay to stand as a critical bibliography, his source citations should prove very useful to other incipient researchers.

As mentioned above, a political theme is present throughout Mr. Wessel's agrument, but it surfaces dramatically with his remarks on allotment. And though he does devote about a third of his essay to this topic, I feel that it could have been expanded, and was a little difficult to follow. According to Paul Gates, writing in the *Encyclopedia of Indians of the Americas* (Scholarly Press, vol. 1, 1975, p. 108), "Allotment policy was a practice engaged in by the U.S. government in which plots of land were awarded in severalty to individual Indians. During most of the 19th century, allotment was utilized as a means of securing the pacification of Indian tribes in the East and removing them west of the Mississippi River. With the passage of the Dawes Act in 1887, allotment became an official government policy, sponsored by reformists in the U.S. government who believed that the solution of the Indians' problems lay in acculturation. Under the act, communal reservations were to be broken up into individually owned plots of land and the Indians were to be encouraged to adopt the white man's idea of property and culture." According to Wessel, "Allotment carried a rationale of its own apart from the objective of making the Indians self sufficient farmers. The idea of individually held farmsteads became a kind of nineteenth century imperative that carried every protest before it." And though some sensitive observers argued against it, and the Five Civilized Tribes fought to prevent it, their voices were weak and did not prevail. Allotment created an "intolerable administrative burden" and resulted in "white-owned-and-operated farms on what was once Indian land." On this note, and without much further comment where further comment is called for, Wessel ends.

But the story continues. And, as late as midsummer this year, Indians continued to fight for their land and their moral right to it. Perhaps another article needs to be written on how agriculture both sustained and destroyed the American Indians.

Reviewed by David R. Hoyt, Technical Information Systems, Science and Education Administration, USDA.

NEWS OF NOTE

Archival Organizations

Three American Indian organizations are of interest because of their archival nature. First, the American Indian Historical Society (1451 Masonic Avenue, San Francisco, California, 94117, Tel. (415) 626-5235) maintains a library and also a museum of Indian arts. It supersedes the Indian Archives and Library, and publishes a quarterly journal, *Indian Historian,* and an annual *Index to Literature on the Native American.* Secondly, The Cherokee National Historical Society (P.O. Box 515, Tahlequah, Oklahoma, 74464, Tel. (918) 456-6007) maintains the Cherokee Cultural Center and Cherokee National Museum which will include a Cherokee National Archives of documents, papers, books, and other materials on Cherokee history and development. Thirdly, The Interamerican Indian Institute of the Pan American Union (17th and Constitution Ave., N.W., Washington, D.C., 20036) is composed of national Indian agencies and institutes in Central, South America, and the United States. The Institute conducts developmental programs for Indian communities and maintains a library containing 25,000 volumes and 600 periodicals all relating to Indians.

Indian Pre-White House Conference

A thirteen member planning committee representing a cross section of American Indians has set goals for a pre-White House conference dealing with library services on reservations. The conference will meet in Denver next October (1979) and will be chaired by Virginia H. Mathews, an Osage Indian who directs Gaylord Professional Publications. The goals of the conference will be to raise library awareness among Indian people, to develop a long-range plan to improve library services on reservations, and to provide relevant input at the White House Conference on Library and Information Science (WHCLIS).

Lummi Project

In 1968-69, a Federal grant was given to the Lummi Indian tribe of Marietta, Washington, for Project Aquaculture, making them the nation's most advanced and exotic farmers. The project, which consists of farming the sea, includes the mass production of oysters, rearing of fresh water trout acclimated to salt water, and a steelhead hatchery. It could employ hundreds of Lummis and would allow them to stay on their reservation and maintain their heritage as people of the sea. When in full production, it is estimated that the income potential will be between $4 and $5 million.

In 1974 the Lummi Indian Aquaculture Sea Farm, situated on 750 acres in Puget Sound in the Pacific Northwest, harvested its first large fish and oyster crops. Annual sales of Coho (silver) salmon, Pacific Ocean trout, and oysters provide a healthy income for the Lummi Indian population. From the Lummi Fish Hatchery, two million fingerling (smolt) fish are released each year into the open ocean; in two to three years they grow to 10 to 12 pounds and return to the Nooksack River. In addition, several million oysters were sold as seed to Puget Sound oyster farmers. Such market-manufacturing income is expected to reach $100-$150 thousand per year.

The initial phases of the Lummi marketing program include the following:

(1) introduction of Lummi Indian products to the food service field offering the Coho Salmon to the public;

(2) promotion and advertising of recipes;

(3) Pacific Ocean Trout, fresh-frozen or Indian-smoked, are available on a customer-order basis only.

Sales are generally made through professional food brokers who represent the Lummi Market Center and sell to frozen food distributors, nationally. Information on the above and current prices for fresh frozen salmon and trout and for smoked fish and oysters are available at the following address:

Lummi Indian Market Center
1200 Westlake Avenue, North
Seattle, Washington 98109
Phone: (206) 284-7672
Manager: Royal Frew

BOOK NOTES

American Indian Calendar 1978. Bureau of Indian Affairs. This calendar lists outstanding events that occur regularly on or near Indian reservations throughout the year. It lists ceremonials, celebrations, and exhibitions of Indian arts and crafts by state giving date, celebration, and location. Visitors may observe artists at work and purchase their products. Inquiries about this and the following publications must be sent directly to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

American Indian Policy in the Jacksonian Era, by Ronald N. Satz (Lincoln: University of Nebraska Press, 1975, 343 pp., paperbound, $4.25).

This book is an analytical study of federal-Indian relations during the Jacksonian era when Indians were systematically removed from their lands. It analyzes the formulation, execution, and results of government policy of the 1830's and 1840's from the perspectives of both ethnohistory and public administration. There are excellent notes at the end of each chapter and an extensive bibliography of both primary and secondary sources.

The Beginnings of Agriculture in America, by Lyman Carrier (New York: McGraw-Hill, 1923, 323 pp., $38.90).

Carrier, who was a plant pathologist with the U.S. Department of Agriculture, wrote this book with the intention that it be used as a text in agricultural courses in colleges. He states in his preface that the agricultural histories of his day "so far have erred in minimizing the colonial and Indian farming . . . ." Indian life and farming are described and a comparison of old world and new world agriculture is included.

Cartographic Records of the Bureau of Indian Affairs has been substantially revised and is now available free from the National Archives (GSA), Washington, D.C., 20408. This publication includes descriptions of the BIA's cartographic records dating from the early 1800's to the mid-1960's. Each numbered entry includes a detailed description.

Famous Indians; A Collection of Short Biographies. Bureau of Indian Affairs. (1974, 50 pp., $1.05).

Along with some 20 short biographies of Indian personages, a suggested reading list on pages 44-49 lists books under the categories of general background, and tribes and individuals, as well as other BIA publications. It is available from the Superintendent of Documents, GPO, 20402.

The Indian Heritage of America, by Alvin M. Josephy, Jr. (New York: Bantam Books, 1969, 397 pp., paperbound, $2.25).

There are some 10 chapters devoted to Indians in the United States, of which chapter six discusses agriculture and the rise of population. The bibliography lists institutions with important materials pertaining to Indians, and periodic publications with information on Indians as well as books and articles. There is a good map on page 344 showing the distribution of Indians in the United States today.

Indians of North America, by Harold E. Driver. (Chicago and London: University of Chicago Press, 2nd ed., 1969, 632 pp., $17.50).

In addition to their cultural and social structure, Driver devotes several chapters to Indians as farmers; their origin and prehistory, horticulture, tools and techniques of farming, food preparation and preservation, nutrition, and crafts are among the topics described at length. The final chapter is devoted to achievements and contributions of the Indians, including domesticated plants, drugs (from plants), furniture, clothing. There are 45 maps which cartographically illustrate various topics including dominant types of subsistence, subsistence areas, natural vegetation areas, distribution of cotton, maize and tobacco, horticultural division of labor, land tenure, and many others. An extensive bibliography lists sources by author.

The Mound-Builders, by Henry Clyde Shetrone. (Reprint ed., Port Washington, N.Y.: Kennikat Press, 1964, 508 pp., bibl., illus., index).

The author attempts to reconstruct the life of a prehistoric American race by exploring and interpreting their earth mounds and cultural remains. The subject of mound-building peoples as agriculturists is discussed including food plants grown, tobacco cultivation, and implements and methods. There some 299 illustrations throughout the book and a bibliography of general as well as regional sources.

North American Indians: An Anthropological Perspective, by William W. Newcomb, Jr. (Pacific Palisades, Calif.: Goodyear Publishing Company, Inc., 1974, 278 pp., $10.95 and $7.95)

The chapters, which are divided by regions, discuss the prehistory and history of the Southeastern and Western farmers, the Northeastern hunter-farmers, as well as non-farmer Indian groups inclusive of culture, type and method of agriculture. Each chapter contains maps and notes and there is an extensive bibliography at the end.

Publications Pricelist. Bureau of Indian Affairs. This publication lists a series of books which recounts the early life, customs and later changes of the Indian tribes. It is available at no charge from Haskell Indian Junior College, Publications Service, Lawrence, Kansas 66044.

PUBLICATIONS OF NOTE

The Agricultural and Hunting Methods of the Navaho Indians. (Yale University Publications in Anthropology: No. 18) By Willard W. Hill. (Reprint ed., New York: AMS Press, 1977, $17.00)

Agricultural Terracing in the Aboriginal New World. By Robin Donkin. (Viking Fund Publications in Anthropology Series: No. 56) illus. (Tucson, Arizona: University of Arizona Press, in progress)

Agriculture of the Hidatsa Indians: An Indian Interpretation. By Gilbert L. Wilson. (University of Minnesota Studies in the Social Sciences: No. 9) (Reprint ed., New York: AMS Press, 1977, $15.00)

Animal Husbandry in Navajo Society and Culture. By James F. Downs. (Berkeley, Calif: University of California Press, 1964, 104 pp.)

Corn among the Indians of the Upper Missouri. By George F. Will and George E. Hyde. (Reprint ed., New York: AMS Press, 1977, $22.50) (Also reprint ed., Lincoln: University of Nebraska Press, 1976, $14.50 and $3.95)

The Economic Botany of the Kiowa Indians. By Paul A. Vestal and Richard E. Schulter. (Harvard University, Botanical Museum). (Reprint ed., New York: AMS Press, 1977, $17.00)

Ethnobotany of the Coachuilla Indians of Southern California. By David P. Barros. (Morongo Indian Reservation, Banning, Calif.: Malki Museum Press, 1977, paperbound, $5.95)

Ethnobotany of the Forest Potawatomi Indians. By Huron H. Smith. (Bulletin of the Public Museum of the City of Milwaukee: Vol. 7, No. 1). (Reprint ed., New York: AMS Press, 1977, $29.00)

Ethnobotany of the Hopi. By Alfred F. Whiting. (Museum of Northern Arizona Bulletin: No. 15). Reprint ed., New York: AMS Press, 1977, $12.50)

Ethnobotany of the Meskawaki Indians, 2 vols. in 1. By Huron H. Smith. Bound with *Ethnobotany of the Menomini Indians.* Reprint of 1923 ed. (Bulletin of the Public Museum of the City of Milwaukee: Vol. 4, Nos. 1 and 2). (Reprint ed., New York: AMS Press, 1977, $40.50)

Ethnobotany of the Navajo. By Francis H. Elmore. (University of New Mexico Bulletin: Vol. 1, No. 7). (Reprint ed., New York: AMS Press, 1977, $18.50)

Indian Foods and Vegetables. By Harriett L. Smith. (Lake Oswego, Ore.: Smith, Smith, and Smith Publishing Co., 1977, paperbound, $2.00)

Indians. Food and Cookery, and *Information about Thanksgiving* are two pamphlets available free from the Bureau of Indian Affairs, Washington, D.C. 20245. Each lists additional books on Indian food and cooking in addition to many interesting facts about Indian foods.

Navajo Livestock Reduction: A National Disgrace. Edited by Ruth Roessel and Broderick H. Johnson. (Chinle, Ariz.: Navajo Community College Press, 1974, 224 p.)

Pima and Papago Indian Agriculture. By Edward F. Castetter and Willis Bell. (Reprint ed., New York: AMS Press, 1977, $21.00)

Potawatomi Tribe of Indians: Natural Resource, Agricultural and Economic Survey from 1795-1846 of Certain Lands Ceded by the Prairie Band. By John L. Coulter. (Library of American Indian Affairs). (New York: Clearwater Publishing Co., 1973, $46.00)

Uses of Plants by the Indians of the Missouri River Region. By Melvin R. Gilmore. (Lincoln, Neb.: University of Nebraska Press, 1977, $11.95 and $3.50)

BIBLIOGRAPHIES

Agriculture of the American Indian: A Select Bibliography, compiled by Cecil Harvey, is being processed for publication by the Technical Information Systems, Science and Education Administration, U.S. Department of Agriculture, National Agricultural Library Building, Beltsville, Maryland 20705. This bibliography is arranged topically under the following seven headings: Comprehensive, Historical, Anthropological and Bibliographic References; The Agriculture of Particular Regions and Cultures; Native American Crops; Livestock; Agriculture on Indian Reservations; Uncultivated Plants, and Irrigation. With the growing interest in the American Indian, this selective bibliographic effort covering books, articles, and dissertations published or completed between 1940 and 1975 is intended as an update to the *Bibliography on the Agriculture of the American Indian* by Everett E. Edwards and Wayne Rasmussen published in 1941 as USDA Miscellaneous Publication 447.

A Bibliographical Guide to the History of Indian-White Relations in the United States, by F. P. Prucha (Chicago, Ill.: University of Chicago Press, 1977, paperbound, $17.50 and $6.95).

Native North Americans in Doctoral Dissertations, 1971-1975: A Classified and Indexed Research Bibliography, by Gifford S. Nickerson (Council of Planning Librarians: 1977, $7.50).

(Robert's ... *Florum Species*)

LEGISLATION OF NOTE

Numerous bills and resolutions directly or indirectly affecting Native Americans have been introduced into both houses of the 95th Congress. To date over a hundred such items are pending. Most will either die in committee or have only slight importance. Below however are listed some of the more significant ones —those which have attracted considerable attention. For more information on these items, to find the latest action taken or the committees to which the bills have been referred, write to David R. Hoyt, Reference Division, National Agricultural Library Building, Beltsville, Md. 20705. To obtain copies of the particular bills, or to express an opinion concerning them, call or write either the sponsor of the bill or your own Congressman.

H.R. 9054
MR. CUNNINGHAM
TITLE AS INTRODUCED:
A BILL TO DIRECT THE PRESIDENT TO ABROGATE ALL TREATIES ENTERED INTO BY THE UNITED STATES WITH INDIAN TRIBES IN ORDER TO ACCOMPLISH THE PURPOSES OF RECOGNIZING THAT IN THE UNITED STATES NO INDIVIDUAL OR GROUP POSSESSES SUBORDINATE OR SPECIAL RIGHTS, PROVIDING FULL CITIZENSHIP AND EQUALITY UNDER LAW TO NATIVE AMERICANS, PROTECTING AN EQUAL OPPORTUNITY OF ALL CITIZENS TO FISH AND HUNT IN THE UNITED STATES, AND TERMINATING FEDERAL SUPERVISION OVER THE PROPERTY AND MEMBERS OF INDIAN TRIBES.

ABSTRACT AS INTRODUCED:
Directs the President: (1) To abrogate all treaties entered into between the United States and any Indian tribe; (2) To convey to individual adult members of such tribe or to a tribal corporation any real property held in trust for such tribe and any funds deposited to its credit in the United States Treasury; (3) To abrogate all hunting and fishing rights; and (4) To subject all members of such tribe to Federal, State, and local laws.

(H.R. 13329, also sponsored by Mr. Cunningham, is similar except it "Terminates the Bureau of Indian Affairs whenever all of the functions rested by law in the Bureau have been terminated as a result of this [H.R. 13329] act.")

H.R. 9950
MR. MEEDS, ET AL.
TITLE AS INTRODUCED:
A BILL TO ALLOCATE CIVIL AND CRIMINAL JURISDICTION AMONG THE UNITED STATES, THE STATES, AND INDIAN TRIBES, AND TO DEFINE THE LIMITS OF STATE AND TRIBAL REGULATORY POWER.

ABSTRACT AS INTRODUCED:
Allocates civil and criminal jurisdiction over Indians between the States and the Indian tribes, and defines the limits of their respective regulatory powers over Indian affairs.

H.R. 9951
MR. MEEDS, ET AL.
TITLE AS INTRODUCED:
A BILL TO REQUIRE ADJUDICATION AND QUANTIFICATION OF ALL CLAIMS TO RIGHTS TO THE USE OF WATER BASED UPON FEDERAL RESERVED RIGHTS FOR INDIAN RESERVATIONS.

ABSTRACT AS INTRODUCED:
Requires the adjudication and qualification of all claims to the use of water based on Federal reserved rights for Indian reservations by the United States district courts within a five-year period of limitation.

H.J.RES. 1
MR. MEEDS, ET AL.
COSPONSORS: BONKER, DICKS, PRITCHARD, FOLEY, MCCORMACK
TITLE AS INTRODUCED:
JOINT RESOLUTION TO PROVIDE FOR THE ESTABLISHMENT OF A COMMISSION TO EXAMINE THE EFFECT OF NORTHWEST INDIAN OFF-RESERVATION TREATY FISHING RIGHTS.

ABSTRACT AS INTRODUCED:
Establishes a Commission to examine the effect of Northwest Indian Off-Reservation Treaty Fishing Rights. Designates its structure, membership, prerequisites, procedures, and powers.

H.J.RES. 206
MR. DINGELL
TITLE AS INTRODUCED:
JOINT RESOLUTION RELATING TO THE REGULATION BY THE STATES OF CERTAIN INDIAN HUNTING AND FISHING RIGHTS.

ABSTRACT AS INTRODUCED:
Allows the States to enact laws regulating off-reservation hunting and fishing granted to Indians by treaty if the laws are: (1) Purely regulatory concerning the time and manner of hunting and fishing outside an Indian reservation; and (2) Equally applicable to Indians and all other citizens.

H.R. 9736
MR. CUNNINGHAM
TITLE AS INTRODUCED:
A BILL TO AMEND THE ACT COMMONLY KNOWN AS THE BLACK BASS ACT TO PROVIDE FURTHER PROTECTION FOR STEELHEAD TROUT.

ABSTRACT AS INTRODUCED:
States that notwithstanding any Indian treaty, laws and regulations of a State prohibiting or restricting the taking or sale of steelhead trout for commercial purposes shall apply to Indians and Indian tribes in the same manner and to the same extent as such laws and regulations apply to other persons.

H.R. 4169
MR. COHEN, ET AL.
TITLE AS INTRODUCED:
A BILL RELATING TO CERTAIN INDIAN LAND CLAIMS IN THE STATE OF MAINE.

ABSTRACT AS INTRODUCED:
Recognizes the prior conveyances of title and interests in lands and waters now comprising the State of Maine made by the Passamaquoddy and Penobscot Indian Tribes as valid and binding. Limits the relief which may be granted as a result of claims arising out of the allegedly wrongful loss of aboriginal title rights in Maine by these tribes to monetary damages. Transfers all cases involving this Act to the United States District Court for the District of Maine. (Similar bill introduced in the Senate by Mr. Hathaway et al., S.842.)

H.R. 9906
MR. WALSH
TITLE AS INTRODUCED:
A BILL RELATING TO CERTAIN INDIAN LAND CLAIMS IN THE STATE OF NEW YORK.

ABSTRACT AS INTRODUCED:
Declares all aboriginal title or interest in lands or water in New York State which have been conveyed to be extinguished effective upon conveyance. Limits relief for the wrongful conveyance of such interests to monetary damages. Provides the United States District Court for the Northern District of New York with exclusive jurisdiction to adjudicate these claims.

H.R. 9175
MR. CUNNINGHAM
TITLE AS INTRODUCED:
A BILL MAKING LAWS AND REGULATIONS OF THE STATE OF WASHINGTON PERTAINING TO FISHING AND HUNTING APPLICABLE TO INDIANS AND INDIAN TRIBES FISHING AND HUNTING AT PLACES (OTHER THAN ON INDIAN RESERVATIONS) WITHIN SUCH STATE FOR PURPOSES OTHER THAN CEREMONIAL PURPOSES.

ABSTRACT AS INTRODUCED:
Declares that the fishing and hunting laws and regulations of the State of Washington shall apply to Indians and Indian tribes (except on Indian reservations or on ceremonial occasions) in the same manner and to the same extent as such laws and regulations apply to other persons.

H.R. 12533
MR. UDALL, ET AL.
TITLE AS INTRODUCED:
A BILL TO ESTABLISH STANDARDS FOR THE PLACEMENT OF INDIAN CHILDREN IN FOSTER OR ADOPTIVE HOMES, TO PREVENT THE BREAKUP OF INDIAN FAMILIES, AND FOR OTHER PURPOSES.

ABSTRACT AS INTRODUCED:
Establishes standards for the placement of Indian children in foster or adoptive homes with emphasis on maintaining Indian identity and preventing the dissolution of Indian families.

S.RES. 405
MR. ABOUREZK, ET AL.
TITLE AS INTRODUCED:
A RESOLUTION TO MAKE THE SELECT COMMITTEE ON INDIAN AFFAIRS A PERMANENT COMMITTEE OF THE SENATE.

ABSTRACT AS INTRODUCED:
Amends Senate Resolution 4 (95th Congress) to make the Senate Select Committee on Indian Affairs a permanent Senate committee.

S.RES. 502
MR. DOLE, ET AL.
COSPONSORS: CRANSTON, HASKELL, MCGOVERN, ABOUREZK, KENNEDY, BAYH, HATCH
TITLE AS INTRODUCED:
A RESOLUTION TO COMMEND THE NATIVE AMERICANS PARTICIPATING IN THE LONGEST WALK.

H.RES. 1263
MR. WEISS, ET AL.
TITLE AS INTRODUCED:
A RESOLUTION TO COMMEND NATIVE AMERICANS PARTICIPATING IN THE LONGEST WALK.

(Robert's ... *Florum Species*)

(*Encyclopedie Methodique ...*)

(Robert's ... *Florum Species...*)

IN PREPARATION

FORESTRY AND AMERICAN AGRICULTURE (Associates NAL Today, n.s., v. 3, no. 3/4, July/December 1978).

Guest Editor, Gerald Ogden

Eight papers and introduction presenting case histories of pertinent organizations involved in and instrumental to the growth of forestry in America.

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